THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW
A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

OLD SERIES
VOL. 13, NO. 6.

NEW YORK, JUNE, 1907.

NEW SERIES
VOL. 5, NO. 6.

FIRST CONVENTION OF THE AMERICAN BRASS FOUNDERS' ASSOCIATION.

An association devoted to the interests of brass and bronze founders, brass goods manufacturers, aluminum workers, platers, polishers and finishers of gold and silver and nickel—in fact devoted to all those having to do with the non-ferrous metals—was inaugurated most successfully at the joint convention of the American Foundrymen's Association, the Foundry Supply Association and the Associated Foundry Foremen, held in the Second Regiment Armory, Philadelphia, May 20-24. This result was due directly to the efforts of Dr. Richard Moldenke, the genial and efficient secretary of the American Foundrymen's Association, with whom the idea originated, and who has untiringly advocated the plan during the past year. In that period those prominently connected with the several industries have been consulted, and it was found there was a strong feeling in favor of an independent organization.

This culminated in the formation of an actual society during the convention. At the first meeting over 100 were in attendance, and a lively interest was manifested in the project. It was known from the start that there was ample material in the thousands immediately connected with these industries to constitute an association of their own, but it was not known until the meeting whether such a proposal would meet with a suitable response. All doubt on this score was speedily settled when the aims and objects of the association were discussed. From the remarks then made it became very evident that the scheme would be received enthusiastically.

On the following day a permanent organization was accomplished, with the usual constitution and by-laws, and a full list of officers to serve during the coming year. Thus launched, the American Brass Founders' Association gives promise of a healthy and useful future; and even now, young as it is, it does not take a prophet or the son of a prophet to foretell the vast benefits its entire membership will derive from it.

The Association at once took upon itself all the prerogatives of a complete organization, even to the reading of papers, several of which, on widely diversified subjects, were presented and discussed. These had been obtained mainly through the efforts of THE METAL INDUSTRY, from those recognized as authorities in their special lines of work.

ORIGIN OF THE ASSOCIATION.

Dr. Moldenke explained the origin of the movement toward the formation of a society to be devoted solely to the interests of the brass and allied trades. He said that during the time of his acting as secretary of the American Foundrymen's Association he had had many members complain that the brass men were being sidetracked because of the predominence in the Association of all matters relating to iron, to the exclusion of subjects appertaining to the soft metals. It therefore occurred to him to see if an independent organization could be formed, one that would cater exclusively to those interests.

The doctor explained that the idea from the first was to "do for your interests what we have done for ours. In many respects your business is more difficult and intricate than ours, and therefore the benefits you would derive from interchange of thought and experience would be more widespreading than ours." The intention from the first has been to establish a society that would be educational in its character and which would leave alone all financial and strictly business matters; questions of that kind would not be within the province of the society.

The next step was the appointment of a committee by the American Foundrymen's Association to thoroughly canvass the field and ascertain, if possible, if such a society would be supported and to learn the reception such a plan would receive.

This committee consisted of Charles J. Caley and Dr. Moldenke, as chairman and secretary, respectively.

WORK OF COMMITTEE.

Four thousand letters were sent out. Of the 450 replies received practically all expressed hearty approval of the scheme, and pledged their support in every way possible. The answers proved that there was ample material wherewith to form such an organization, could it once be brought into shape. The doctor reported that this had been done and the work of the preliminary committee finished. The American Foundrymen, through their committees, had done all in their power to aid the movement, and it now remained for those present to place the proposed society on a firm and permanent footing. It was therefore moved the election of a temporary chairman and secretary. This resulted in the election of Charles J. Caley, chairman, and Dr. Moldenke, secretary of the meeting.

REMARKS OF CHARLES J. CALEY.

Mr. Caley said:

It gives me great pleasure to accept the position as temporary chairman of your convention. On behalf of Dr. Moldenke and myself, I extend to you all a hearty welcome. I wish also to thank you for the interest you are taking in the formation of a Brass Founders' Association, the purpose for which this convention is called. I desire to congratulate the firms represented on having such an intelligent and representative body of men; it speaks volumes for the future welfare and prosperity of our association.

The necessity for an organization having for its object the betterment of the brass industry should appeal to all concerns directly or indirectly connected with same. Our capital will be education along similar lines to the parent organization.

The question will no doubt be asked, "Who are eligible as members of the association?" My answer is: Brass foundrymen, rolling mills, platers, supply men, electric workers and automobile interests—in fact any one directly or indirectly connected with the non-ferrous metals or their alloys.

Imagine if you can the field this will cover, and the chances there will be for research and study of the many varied and perplexing questions that will arise and the fund of information that will be forthcoming from the papers read and discussions had at the conventions and during the intervening time. Great things have been accomplished in the brass foundry during the past 20 years.

The oil melting furnace has become a factor and is making rapid strides, though its field has as yet been limited to heavy castings; so far it has been unable to replace the pit furnace for light castings, plain and ornamental, as used in builders' hardware, saddlery, etc. There is much work and study for the inventor along this line.

The moulding machine has not met with as much success in the brass foundry as it should, possibly due to the character of the work and the cost of making and maintaining patterns. Here again is work for the inventor in the building of a machine where a standard frame may be used; this frame may be so arranged that by a simple method any gated or loose patterns may be attached quickly and accurately. I believe it is possible, and I am looking forward to the day when it appears on the market. I know of a dozen firms to-day with thousands of patterns in their vaults who would be only too glad to install moulding machines in their brass foundries if they could obtain results without going to the expense of regating their patterns, as is necessary with the moulding machines of to-day. It is possible and probable that I may be contradicted on both of these items, but, like the man from Missouri, you will have to show me the goods in order to convince me that I am not correct in the statement made.

Handling, as I do, hundreds of tons of brass and bronze wrought metal, and knowing the difficulties I have in working same, due to defects in metal, I believe that the rolling mills have their own troubles, as well as the foundrymen, and I believe in many ways they can be benefited by membership in our association.

The automobile interests claim more than a passing glance on our part, on account of the many intricate castings made necessary in the making up of same; castings that must be accurate and so constructed that they will stand the tensional and tortional strain to which they are subjected on the country roads, and in our suburban towns—and in passing I might add some of our cities. To accomplish the results desired it is necessary that the foundryman making same should have in his employ men with a thorough knowledge of the foundry business and its requirements; men familiar with core making as well as the mixing and melting of metals required in automobile work.

Plumbing and steamfitting interests certainly come in for their share of our attention, as they have made wonderful strides in the past 20 years, when we consider the old-fashioned closed plumbing and the up-to-date open plumbing, the making of which has caused a revolution in the art of making light, durable castings. The same is true of steamfitting, as many of the valves of to-day are cored, where years ago they were bored. Steam pressure has been raised without showing any bad effect, which would go to prove that an advance had been made in the mixture of metals to the extent that the cored valve of to-day is lighter by one-third than the valve of years ago.

From THE METAL INDUSTRY I quote the following: "Membership in a society of this kind cannot but result to the advantage of all those joining. Social, commercial and strictly technical features are present, and from one or the other of these, benefits must be derived. This is an age of millionaires and societies, and while we cannot all belong to the first, we can and should be an integral part of the second."

There is much more that I could say on these subjects that would be of interest, but I believe at this time it is only necessary to place before you an outline of the work that can be accomplished by an association of brass founders.

APPOINTMENT OF COMMITTEES.

At the conclusion of Mr. Caley's remarks it was moved to appoint committees, one to draw up a constitution and by-laws and the other to nominate officers for the coming year.

At this stage of the proceedings the members broke out of bounds and ignored completely the question before the meeting. A dozen men explained what they could do or had done—all were silent upon what they could not do, and the knotty problems were left out—and the remarks ranged from the difficulty of obtaining an education after becoming a journeyman to the use of wax tapers in cores 40 years ago, when one of the members was learning his trade. Promises were freely made to help any brother out of trouble, and it seemed as if the collected knowledge of all those present would be placed at the disposal of any one who cared to apply. Nothing was said about the secrets of the brass industry—there were none and never had been. There was a seriousness and earnestness about

it all that impressed the conviction that the future meetings of the association would certainly not lack interest, either in the papers to be presented or the discussions that would follow. This little breaking away from parliamentary rules was one of the most encouraging incidents of the entire meeting.

The chairman very wisely let the remarks go on until, upon call for the question, the motion was carried. The chair appointed the following to act as a committee to draw up a constitution: Dr. Moldenke, W. M. Corse and Palmer H. Langdon.

The following gentlemen served as a nominating committee: Palmer H. Langdon, Henry O. Evans, W. R. Webster, R. Marshall, August A. Miller, Charles H. Proctor and J. F. Webb.

Several papers had been prepared for this meeting and these were now read.*

The first paper was by Andrew M. Fairlie and dealt with

SCIENCE APPLIED TO THE BRASS INDUSTRY.

"Science is not nearly so formidable as many believe. She should be respected, it is true, but not treated with awe; for the benefits she has bestowed she should be admired, not feared and shunned; and while she continues to promise aid, economically lightening the labors of men, improving the quantity of products and the efficiency of processes, she should be cherished, not ignored, maligned, nor abused." Analytical chemistry claims the attention of the brass maker. It detects impurities in the commercial metals from which brass is made; it locates and measures the losses in the business; it standardizes mixtures, and shows the exact composition of any alloy submitted for duplication.

The methods of recovering metals from scrap have been improved, and metallurgical research has found the cause of porosity in castings. It has aided in doing away with the oxidation of metals in the foundry.

Physics has furnished the conductivity bridge and the pyrometer, and the purity of copper is now ascertained by electrical means and appliances. Since the pyrometer indicates the exact degree of high temperatures, its use has made furnace operations more reliable. The microscope has revealed the different structures resulting from different proportions of metals and the handling of them under varying heats. The advantages of the moving electrode have been recognized in electroplating.

All these and many scientific discoveries and inventions are now in daily use in the brass industries; each has added its portion to the more accurate and economical production of metals and alloys.

Mr. Fairlie is of the opinion that the electroplating industry has more need of the chemist and metallurgist than perhaps any other branch of the non-ferrous metal industry. Rule of thumb methods do not meet the requirements of the plating room. The electroplating shop ought to be, "and must become, an electro-chemical and metallurgical laboratory on a commercial scale; that the handful of this, the pinch of that and the bucketful of the other—yes, even the drachm and ounce and gallon—must give place to the gram and liter; in short, that science must foster an industry that was born of science."

The paper then mentions the electrolytic stripping of brass from iron, by means of which superfluous brass may be stripped from parts of bicycles and other work which has been subjected to the brazing process. Sherardizing is also mentioned and the method is described somewhat in detail.

The problem of the efficiency of furnaces is a field but little trod. A very small proportion of brass melters know the relation the heat units utilized bear to the heat units in the fuel, and the efficiency of their furnaces is a question about which they are in total ignorance.

The paper devotes considerable space to a consideration of the manufacture of non-ferrous alloys by electricity. The author closes with the following:

"Other conditions, laid down for the progress of another industry, yet applicable to our own, are: 1. Wider circulation of scientific and technical literature. 2. Discovery of new facts in science useful to the industry. 3. Clearer knowledge of the laws correlating to these facts. 4. Increasing application of science to industrial needs."

A paper by Charles H. Proctor was on the

ELECTRO DEPOSITION OF BRASS.

"The electro-plater, by his art, united the craft into one common mass, and so it should be with this great brotherhood of workers in iron and brass. The electroplater, on the common level, congratulates you upon this endeavr to unite your efforts and bids you 'God speed.' Of all the metallic deposits now employed by the plater, there is none that gives so much trouble and requires such careful treatment as the brass bath." Mr. Proctor then gave many examples drawn from his own wide experience of the deposition of brass. As a incident: "To-day the brass bath is normal; work has been accomplished all day with satisfactory results. To-morrow a slight variation of color is noted, with a slight tendency toward a reddish yellow. In nine cases out of ten an addition of zinc will be made when, according to the study of the alloys, copper should be added to reimburse the loss noted by the change of color. When it is remembered that copper is essentially the great factor in a well composed brass bath, which largely consists of this metal, and that zinc is withdrawn very slowly, the bath should be regulated with copper."

Mr. Proctor was in favor of using anodes of copper, since by that means the plater can make no mistakes as to the metal necessary to produce the color. In his own practice he uses anodes of cast copper and zinc in the proportion of 3 anodes of copper to 1 of zinc. In this manner he found it possible to easily maintain a uniform deposit by the addition of cyanide and the soda salts, with an occasional addition of the metallic salts.

The author also referred to the use of cuprous sulphite or red copper compound, which is rapidly replacing the acetate and carbonate of copper in the production of deposits of copper, bronze and brass. The results he has obtained with this have been eminently satisfactory. His standard solution that can be made the basis of a copper, bronze or brass bath consists of

Water	1	gal.
Cyanide of potassium	6	ozs.
Cuprous sulphite	2½	"
Sodium bisulphite	2½	"

Mr. Proctor concluded as follows:

"And now a few remarks for the future. As the birth of the nation occurred in this city of Philadelphia, it is befitting that the birth of this great Brass Founders' Association should take place within the shadow of Independence Hall. It would also be befit-

*These papers had been prepared in pamphlet form by THE METAL INDUSTRY and were now distributed. Copies have been sent to all the readers of THE METAL INDUSTRY, so that it is not now necessary to more than outline them. If any of our readers have not received them we shall be glad to send another upon request.

ting if this city should see the birth of another great association. I refer to an Association of Platers and Polishers. You create, we finish and adorn your work; so it would be well if the Iron Founders', the Brass Founders' and the Platers' and Polishers' associations should become as one, each the handmaiden of the other. Only by these methods can the great standard be maintained, for what is essential to one should be the welfare of all."

A paper prepared especially for this meeting was by Walter B. Snow,

A PLEA FOR HEALTHFUL CONDITIONS IN THE BRASS INDUSTRY.

The fumes incident in some branches of the brass industry are disagreeable, but the real danger to health lies in the particles of dust which are breathed in the polishing, grinding and finishing rooms. These produce constant irritation and are the direct cause of more deaths than all the other troubles combined. The paper described the exhaust method of removing dust which is formed locally, as in connection with grinding and polishing wheels. The objection of the workman to hoods is generally due to their faulty design and improper construction. The success of the fan depends not only upon its speed and its proper proportioning to the work, but also upon the system of piping and hoods which would give the greatest efficiency. The paper then describes the designs of hoods and the sizes of piping for various kinds of polishing wheels. The tumbling barrel exhaust also received attention, and the area of fan for the work given. Several illustrations accompany the paper. The author states: "With installations such as are here described it is possible to maintain a relatively healthy atmosphere, which is bound to secure better work. Between the humanitarian spirit of the employer, the financial advantage of healthful conditions, and the requirements of the law there certainly is no reason why healthful conditions should not be found wherever the brass industry is pursued."

AUTOMATIC POLISHING

was the subject of a paper by James A. Parker, in which the statement is made that "Automatic polishing has been held back because of a crazy endeavor of inventors to construct a machine that would polish anything from a button to a cook stove." But now machines are made to polish buttons and nothing else; no attempt is made to polish all the parts on this one machine; other parts are polished on other machines having no point of resemblance to the first. This referred to stove work.

Ragged and irregular shapes cannot be polished with the machine. Mechanical polishers are now doing good work, and while their use is by no means universal, they have a wide field before them.

REPORTS OF COMMITTEES.

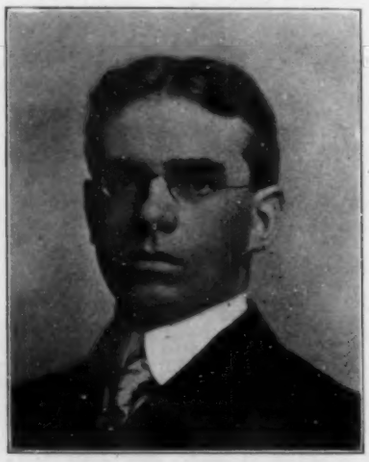
On the following day the committees on constitution and officers made their reports. The constitution provides the name of the organization, and the objects, which shall be solely educational. The membership is divided into classes, honorary and active. Any concern or person who is engaged in the production of any product or allied product included in the title of the association, or the supplies entering therein, such as owners, superintendents, chemists, foremen and accountants, are eligible to active membership. The remainder of the constitution follows very closely that of the American Foundrymen's Association, and need not be repeated here.

AMERICAN BRASS FOUNDERS' ASSOCIATION.

After considerable discussion the name as given above was decided upon as the official title of the organization. The constitution as a whole was then adopted.

President. Secretary. Treasurer.

CHARLES J. CALEY.



ANDREW M. FAIRLIE.

JOHN H. SHEELER.

OFFICERS FOR THE COMING YEAR.

The names recommended by the committee were as follows:

President, Charles J. Caley, general manager of the Russell & Erwin Manufacturing Company, New Britain, Conn.

Secretary, Andrew M. Fairlie, chemist of the Tennessee Copper Company, Copperhill, Polk Co., Tenn.

Treasurer, John H. Sheeler, senior partner of the Sheeler-Hemsher Company, Philadelphia, Pa.

VICE-PRESIDENTS.

New England.

William R. Webster, general superintendent of the Bridgeport Brass Company, Bridgeport, Conn.

Walter C. Allen, general superintendent of works, the Yale & Towne Manufacturing Company, Stamford, Conn.

W. R. Park, superintendent The United Injector Company, Boston, Mass.

New York and New Jersey.

W. L. Abate, general superintendent of the Nathan Manufacturing Company, New York City.

Pennsylvania and Delaware.

Granville W. Wright, second vice-president and manager of the Reading Hardware Company, Reading, Pa.

Central States.

W. M. Corse, assistant superintendent, Detroit Lubricator Company, Detroit, Mich.

Western States.

J. N. Gamble, general superintendent of the Western Tube Company, Kewanee, Ill.

Southern States.

Edro Richardson, brass founder, Baltimore, Md.

Canada.

Nathaniel K. B. Patch, manager of the Lumen Bearing Company, Toronto, Can.

J. R. Meadowcroft, manager of the Garth Company, Montreal, Can.

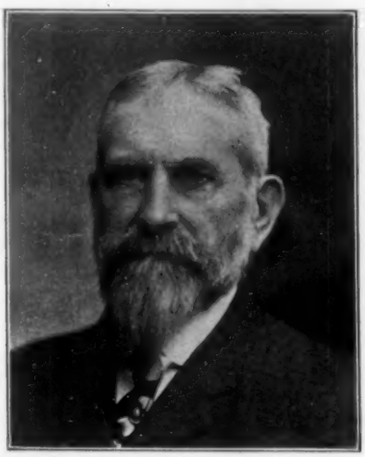
Section of Platers and Polishers.

Committee of one to get members for a Platers and Polishers' Section, Charles H. Proctor, foreman plater, F. H. Lovell Company, Arlington, N. J.

Upon motion, those nominated were elected unanimously, the secretary casting the vote.

VICE-PRESIDENTS REPRESENTING NEW ENGLAND STATES.

WILLIAM R. WEBSTER.



W. R. PARK.

WALTER C. ALLEN.

ADJOURNMENT—CONVENTION NEXT YEAR.

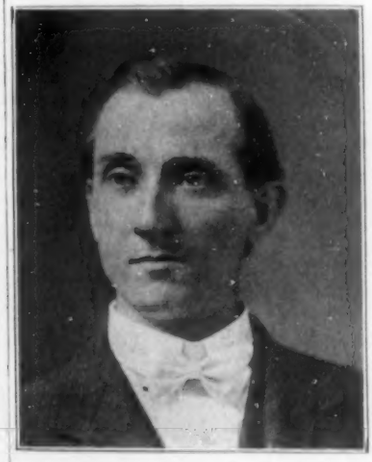
A hearty vote of thanks was then given Dr. Moldenke for the work he had done in organizing the association, after which the president, the secretary and the treasurer for the ensuing year—Charles J. Caley, Andrew M. Fairlie and J. H. Sheeler—acknowledged gracefully the honors which had been conferred upon them. The convention then adjourned to meet with the American Foundrymen's Association the first week in June, 1908.

It may be well to state that the constitution provides for 10 vice-presidents. This was done in order that different parts of this country and Canada might be represented, namely, New England, the Central States, the West and Canada. In this way the association will be adequately represented geographically.

VICE-PRESIDENTS REPRESENTING MIDDLE STATES.

W. L. ABATE.

GRANVILLE W. WRIGHT.



EDRO RICHARDSON.

OFFICERS.

The association is to be congratulated upon the character and ability of the officers who were elected to serve the first year. All are interested in its welfare and each will do his utmost to place the American Brass Foundrymen's Association on a permanent footing. They are all willing and anxious to work for its advancement, and all can be relied upon to do all in their power for its success.

We are pleased to present portraits of eleven of them (photos of the others not received) and sketches of the President, Secretary and Treasurer. Some of the Vice-Presidents favored us with short sketches of their business careers, though the most of them were modest to a fault, it being with extreme reluctance that they even sent us their photographs.

CHARLES J. CALEY.

Charles J. Caley, the President, is well known throughout the whole country, being the general manager of the Russell & Erwin Manufacturing Company of New Britain, Conn. In the convention (May) number of THE METAL INDUSTRY we publish a sketch of Mr. Caley's business life and told how he had advanced step by step from a boy at the bench to the general managership of one of the largest hardware manufacturing concerns in the United States. Besides having been elected President of the Brass Founders' Association at the convention, Mr. Caley was also elected Vice-President of the American Foundrymen's Association. He is a member of the American Society of Mechanical Engineers and trustee of the New Britain Lodge of Elks and past master of the Ancient Order of United Workmen.

ANDREW M. FAIRLIE.

Andrew M. Fairlie, the Secretary, is a native of Glasgow, Scotland. At the age of 4 he came with his parents to this country. He received the usual grammar and high school education, and in 1896 entered Harvard College, taking his degree four years later.

He first became associated with the non-ferrous metal industry in 1902, when he was engaged by the Detroit Copper and Brass Rolling Mills, Detroit, Mich., as chemist. At the end of two years he left this firm to accept the position of chief chemist with a copper mining and smelting company in the far West. Returning East in 1905, he entered the employ of the Tennessee Copper Company as head assistant chemist, but was soon advanced to the position of chief chemist, which he now holds.

Mr. Fairlie is a member of the American Chemical Society, and is the author of numerous papers on subjects pertaining to the brass and copper industries.

JOHN HOWARD SHEELER.

John Howard Sheeler, the Treasurer, is the senior member of the Sheeler-Hemsher Company, brass founders, of Philadelphia, Pa. Mr. Sheeler was born in Chester Co., Pennsylvania, March 2, 1868. He attended private and public schools until 1886, when he entered the employ of a wholesale stationer as salesman. Two years later he opened a retail stationery store, and in 1890 disposed of this busness to enter the theatrical profession as manager, and continued as such until 1902, when he disposed of his interests and formed the present partnership. Mr. Sheeler is very popular among the brass fraternity.

VICE-PRESIDENTS.

GRANVILLE W. WRIGHT.

After learning the pattern and tool making trade at the Benedict & Burnham Manufacturing Co., Waterbury, Conn., Mr. Wright became superintendent of the Taylor Manufacturing Company, New Britain, Conn. From there he went to Sargent & Co. at New Haven, Conn., as superintendent. For twelve years and a half he was superintendent at P. & F. Corbin's, New Britain, Conn., and left there to go to the Reading Hardware Company, Reading, Pa., where he is second vice-president and manager.

VICE-PRESIDENTS REPRESENTING WESTERN STATES AND CANADA.

J. N. GAMBLE.

J. R. MEADOWCROFT.

W. R. PARK.

W. R. Park was one of the original incorporators of the Hancock Inspirator Company, and in 1876 designed and manufactured the first inspirators that were made for commercial purposes. Mr. Park is superintendent and mechanical engineer of the United Injector Company of Boston, Mass., which company includes the Hancock Inspirator Company and the Hayden & Derby Manufacturing Company, each being subsidiary companies of the engineering firm of Manning, Maxwell & Moore, incorporated, New York.

J. R. MEADOWCROFT.

J. R. Meadowcroft has been with the Garth Company, of Montreal, Canada, since 1871, starting as a boy in the brass finishing shop. He is at present gen-

eral manager and a director of the company, also a director of the Ajax Metal Company of Canada, limited. He is a member of the Montreal Board of Trade, of the Builders' Exchange of Montreal and is associated with a number of manufacturers' associations of Canada.

MEMBERSHIP.

The following is a list of the members who have officially joined the American Brass Founders' Association. Many others are practically members, but have made no formal application. These applications should be made to the Secretary, Andrew M. Fairlie, P. O. Box 197, McCays, Tenn. As the fiscal year of the society will begin July 1, 1907, all applications for membership received before that time will be considered as charter members. The dues are $5 per year.

OFFICIAL MEMBERS TO DATE.

Chas. J. Caley, Russell & Erwin Manufacturing Company, New Britain, Conn.

Thomas Evans, Eynon-Evans Manufacturing Company, Philadelphia, Pa.

Chas. C. Bacon, Ross-Tacony Crucible Company, Tacony, Philadelphia, Pa.

W. S. Quigley, Rockwell Engineering Company, New York City.

Henry M. Lane, Lane & Carr, Cleveland, Ohio.

John E. Lonergan, J. E. Lonergan & Co., Philadelphia, Pa.

W. M. Corse, Detroit Lubricator Company, Detroit, Mich.

W. E. Naville, R. B. Seidel, Inc., Philadelphia, Pa.

F. W. Wakefield, F. W. Wakefield Brass Company, Vermilion, Ohio.

J. N. Gamble, Western Tube Company, Kewanee, Ill.

C. D. Cramp, Cramp's Ship Yards, Philadelphia, Pa.

W. G. Speakman, Speakman Supply and Pipe Company, Wilmington, Del.

J. J. Kasjens, Brass Foundry and Heating Company, Peoria, Ill.

Geo. W. Walters, Dent Hardware Company, Fullerton, Pa.

M. J. Reilly, Franklin Brass Foundry, Brooklyn, N. Y.

Wm. A. Smith, Atlas Brass Foundry, Brooklyn, N. Y.

Philip Mueller, H. Mueller Manufacturing Company, Decatur, Ill.

W. E. Crest, Crest Valve Manufacturing Company, Chittenango, N. Y.

J. A. Gutsche, 682 East 102d street, Philadelphia, Pa.

N. Taylor, Robert Taylor & Son, Paterson, N. J.

J. H. Sheeler, Sheeler-Hemsher Company, Philadelphia, Pa.

Wm. L. Wilson, U. S. Aluminum Company, Pittsburg, Pa.

Andrew M. Fairlie, Tennessee Copper Company, Copperhill, Tenn.

A. H. Hecker, The Wm. Powell Company, Cincinnati, Ohio.

E. C. Register, J. Register Sons Company, Baltimore, Md.

J. H. Schutz, H. Mueller Manufacturing Company, Decatur, Ill.

Wm. T. Hartman, P. & F. Corbin, New Britain, Conn.

Palmer H. Langdon, THE METAL INDUSTRY, New York City.

D. A. McConnell, Lovell-McConnell Manufacturing Company, Newark, N. J.

CONVENTION PERSONALS.

First in war, first in peace, first in the hearts of foundrymen—Dr. Richard Moldenke.

"Everybody seems to be satisfied."—J. H. Sheeler, treasurer of the A. B. F. A.

Major Damascus Bronze Brown marshalled in a number of brass boys at the A. B. F. A. meeting.

The dignity of the Naugatuck Valley was very well carried by Wm. R. Webster, from the town of Bridgeport.

The way to a man's heart is through his stomach and Chairman Evans reached the foundrymen's hearts by a dinner of shad and some barley tea to wash down the bones.

THE SMOKER.

The feature of the evening of the Smoker was the presentation to Dr. Richard Moldenke of a beautiful gold-lined silver punch bowl and $1,200 in cash, which represented the equivalent of a trip to Europe. We are

pleased to present a photograph of the punch bowl and wish Dr. Moldenke a safe and pleasant European trip, which he hopes to make later.

EXHIBITS.

A complete report of the exhibits and of the proceedings of the Foundry Supply Association will be found on our department page of Associations and Societies.

ALUMINUM MANUFACTURES IN INDIA.

Consular reports state that the manufacture of aluminum articles has been successfully inaugurated in India. It was begun under government patronage, but is now being carried on by individual enterprise. The factory at Madras is turning out a large number of aluminum milk pails, water bottles, kettles, saucepans, cigar and cigarette cases, razor strops, etc. The native artisan takes readily to the new industry, and the people seem to like the new metal quite as well as copper, yellow metal and tin, to which they have been accustomed for centuries. But for the high prices asked for aluminum ware it would soon supplant to a considerable degree utensils made of copper and copper and tin alloy. The metal is imported from England in the form of disks and sheets ready for working. The imports for the fiscal year 1906 amounted to 180,880 pounds, valued at $60,195, against 99,680 pounds, worth $35,080, in 1905.

The production of aluminum from clay has not yet been attempted in India for commercial purposes, but laboratory experiments have shown that bauxite or aluminum ore exists in large quantities in the central provinces, and awaits the coming of some enterprising person, with modern machinery for manipulating it, to establish a new and valuable industry for India.

TIMEPIECES IN NORWAY.

Writing from Bergen, Consul Johnson says that ten years ago American clocks were in great demand at that place, but since then there has been a gradual falling off until now it is hardly possible to find an American clock in the whole city. The principal reason for this is the lack of ornamentation. The American clock has a plain wooden case with no carvings or ornamentals; the dial could also be improved. These have been supplanted by clocks of Ger man make which have neatly carved cases, with faces of metal, engraved dials and figures. Although the works in the American clocks are better than those in the German, this advantage cannot offset the drawback just mentioned.

POSSIBILITIES OF ELECTRO-METALLIZATION.

By L. G. Delamothe.

Since the beginning of civilization, and long before the Christian era, the Egyptians knew the art of metallization.

The fact that metallized vases of wood and terra cotta and life-size statues weighing only a few pounds have been discovered in the supulchers of Thèbes and Memphis is a sure proof of their knowledge.

However, the process was entirely forgotten and considered a lost art until 1837, when Jacobi, after numerous trials, succeeded in producing perfect specimens of galvanoplasty using metallic moulds. Later on Bocquillon, in France, and Murray, in England, got specimens of deposits on non-metallic substances by the aid of plumbago.

OAK LEAF METALLIZED.

Since then very little progress has been made in this line, and, in fact, until recently no scientific papers have done anything to encourage this very interesting branch of industry.

When one thinks of the possibilities and the field this art has he is wondering why it has so few adherents. Take for example in the line of lamp shades. How beautiful some can be made with natural ferns, wild flowers and leaves metallized and the innumerable varieties of picture frames! Electric portables, clocks and chandeliers can be decorated in the most artistic manner and be unique in their creation.

Beautiful jewelry boxes, millinery trimmings, art trays, card receivers, etc., can be produced at light cost and true to nature.

All the perishable goods can be made everlasting. Take for instance the first pair of baby shoes, which can be used as paper weights or pin cushions, and be in the family forever; a flower from a wedding bouquet can be made in a hat pin and be enjoyed by the bride the rest of her life.

So many are the uses of this beautiful art that it is surprising there are so few who try to master it.

For my part I have devoted most of my time to the study and practice, and I have produced what experts call beautiful specimens; in fact, too good for the trade, because they are so different from the articles now on the market that it is hard to find many people who want to believe that the article they see used to be a genuine flower picked out in the garden, or a leaf of a tree from the wild woods.

One cause of the setback of the metallization lies in the lack of knowledge of the plater or the chemist in regard to the finishing and decorating of the subjects.

After the flowers, branches or leaves are metallized they have to be soldered together and so arranged as to correspond to the design for which they are intended; the polishing then takes place. But the most difficult is the decorating. As I said before these articles are so different, so true to nature, that it is impossible to use any of the standard finishes to good advantage.

I find the art nouveau and the polychrome finishes the most suitable for the purpose, but they are hard to produce, and I think that is one of the reasons why the metallizaton is so far behind as an art and so little known by the public in general.

In my opinion it is to the plater and to the artist to develop it, and I firmly believe a large reward will compensate in the end the little trouble they will encounter in the beginning.

ROLLING STERLING SILVER HOT.

Our facilities for rolling silver hot have been crude, but the results obtained therefrom were very satisfactory; in fact, we have taken sheets of silver which were blistered or cracked, and, after rolling them hot, they came out as perfect sheets which we were able to use in spinning and stamping purposes. Will you kindly inform us whether there are any firms or manufacturers who make a roll especially for rolling hot metals, and could you also inform us whether you know of any silver manufacturers who roll their hot metal?

Chilled cast iron rolls should be used only. Steel rolls will flake and crack on the surface. Any good make of rolls will do. The silver should be heated to a red heat and rolled quickly. The advantage is in the saving of annealing, and in thick metal it will weld blisters. The method of rolling silver hot has been employed in England by Jas. Dixon's Sons, Sheffield, and in the United States by the International Silver Company, of Meriden, Conn., for ten or more years.

Silver and silver plated ware have a good chance in Turkey, according to the report of the Consul at Trebizond. What little there is comes from Germany and England. It is very expensive, and far inferior in artistic taste to the American ware.

The trustees of the Brooklyn (N. Y.) Public Library have voted to place a bronze tablet of Mr. Carnegie in each of the library buildings which he gave to the city.

REMOVAL OF OXIDES WITH DILUTE HYDROCHLORIC ACID.

By Chas. H. Proctor.

It is commonly accepted among many platers that sufficiently strong solutions of potassium cyanide will remove all oxides or discolorations from polished metal surfaces, whether of brass, copper or bronze. However this may be, it is a fallacy to a certain extent. Cyanide solutions will remove oxides from brass and copper, and even bronze for some deposits, but not all. Recently the writer was asked to decide a question why it was that brass could be successfully nickel plated, while in the same solution an article made of bronze would invariably peel or strip. The inquirer stated that he had considerable trouble from this, and was unable to explain it.

In the production of plumbers' hardware a large percentage of the articles are made from what is termed "cast bronze." In this mixture a certain percentage of tin is used to produce the close-grained metal so much desired for this class of work. When the articles have been machined and polished ready for the plating it is the usual custom to use the potash bath to remove adhering polishing grease. The article is washed carefully, immersed in the nickel bath. Upon removing and applying the final finish the polisher wonders what caused the cloudy effect in the deposit, or the peeling that frequently occurs, while nickel deposits upon cast or sheet brass are generally satisfactory. The reason is that the caustic alkali solution absorbs some of the tin in the metal, and by chemical action redeposits it upon the surface in the form of an oxide by the action of the copper and zinc in the alloy. This oxide is not always visible unless placed in the sunlight, when, by holding at the proper angle, it may be observed and moved by passing the finger over the surface. This is the oxide which forms in like manner upon articles of brass soldered with soft solder when placed in very hot solutions of potash for cleaning.

Cyanide solutions do not remove this oxide completely, but a solution composed of 3 to 5 per cent of hydrochloric acid in water will entirely remove any oxide formed and leave a chemically clean surface, which will avoid cloudy and non-adhering deposits upon brass, bronze or copper. This is much more satisfactory than cyanide solutions for removing the oxides for nickel plating.

TIMEPIECES FOR BRAZIL.

According to Consul-General G. E. Anderson, of Rio de Janeiro, the imports of clocks and watches into Brazil from the United States increased considerably during 1906 as compared with the previous year. The statistics of the United States show that the exports of watches and clocks to Brazil for the past three calendar years were $56,111 in 1904, $68,804 in 1905, and $77,485 in 1906. The granting of the preferential reduction of 20 per cent. on all watches and clocks from the United States imported into Brazil, which went into effect about the middle of 1906, marked the beginning of a new movement in American time-keeping instruments, not so much because of the reduction itself as because of the interest it has aroused in the Brazilian market among American manufacturers. At the present time the United States leads in the clock trade and Switzerland in the watch trade, but there is a demand for higher grade watches.

HARDENER AND BRIGHTENER FOR COPPER SOLUTIONS.

By George O. Thompson.

Platers of metal novelties very often receive large lots of soft metal trimmings, vases, figures, plateaux, etc., straight from the casting room to be plated and finished bright. In order to get the desired finish it is absolutely necessary to have a good copper solution that can be made to yield a bright deposit, so as to give the finished article the appearance of having been buffed. The following brightener, added to any good cyanide copper solution will make it yield a lustrous deposit: Take caustic potash 1 lb,, carb. of lead 10 oz., cream of tartar 8 oz. To prepare, dissolve the caustic soda in water, gradually add the carb. of lead, then the cream of tartar. Add about 6 oz. to every hundred gallons of solution once per week, or a little more if necessary, according to the amount of work going through the solution. Should it be necessary to add a little while work remains suspended in the solution, shut off the current and add the brightener with stirring. The brightener can be used in either hot or cold copper solutions. After the articles have remained in the solution a sufficient length of time they are removed, rinsed thoroughly in water, run through the hot potash, swung dry, then given a quick dip in the bright acid dip, rinsed thoroughly, then run through the cyanide dip and laid in clean running water. The final operations depend on the finish desired. If for bright gilt, they are flashed in a good brass solution, rinsed and gilt—or flashed in the brass solution, lacquered and then run through the gold dye. There are many good features attending the use of this brightener. My experience proves that it prevents, to a great extent, spotting out on soft metal work. On other work, such as iron and brass, I find it very useful, because by adding more cream of tartar the deposit goes on nice and hard, so that a thin deposit can be made to stand considerable buffing before it will cut through. If the buffers complain about the deposit being to hard, which they soon will should the plater add too much cream of tartar, the difficulty can be readily overcome by an addition of about 20 pounds of sal soda to the copper solution.

SMOKE FINISH OR PARABOLA BLACK.

By Chas. H. Proctor.

Smoke finish or parabola black may be produced in the following manner: Prepare the articles in the brush brass finish. Then prepare No. 1 extra turpentine copal varnish like a lacquer thinned with turpentine. Immerse the articles, drain and allow to dry somewhat. Now apply smoke from a gas flame, preference being given to a soldering blowpipe without using the air pressure. If possible, it is best to use a slow running lathe to turn the work. The flame can be so applied as to produce a dense black and can be shaded as desired. There is no abrupt or sharp line of demarkation between the natural color of the article and the shaded portions of the black, if the article is carefully manipulated. Finally lacquer in a good body dip; lacquer in the usual manner. This is the method pursued in the production of all this class of work.

The mineral barytes is used commercially for weighting papers and adulterating white lead. The bulk of the supply is of domestic production and it is quoted at $13 to $38 per ton.

TINNING AND GALVANIZING IRON CASTINGS.

By W. L. Churchill.

The coating of grey-iron castings with tin, zinc, lead or alloys of same, by dipping in the molten metal, can, by means of an intermediate electro-deposit, be accomplished in a manner to render results equal in appearance, and closely approximating in protectiveness and economy of application, the coating of wrought and malleable irons, steel, etc., with these metals by direct dipping. The use of this method allows the substitution of cast iron for the more expensive white metals, and at an increase in strength; it also enables effects in finish and coatings for certain protective purposes for which the electro-deposits of these metals are unsuited.

It is the purpose of this article to explain briefly the technicalities involved in the method, and point the way to its successful accomplishment, by either the electro-plater, who may need, or desire, to add this branch of metal-finishing to the list of his activities, or the practical tinner or galvanizer who may be called upon to coat cast iron, generally considered as impracticable, or prohibitive in cost.

The coating of wrought and malleable irons, steel, wire goods, etc., necessitates, first, a thorough cleaning of the surfaces to be treated, which is usually accomplished by means of acid pickles adapted to the particular requirements; the sand blast is also an effective ally for this work, and there is nothing involved in the preliminaries that the average plater would not readily understand; there is less occasion for the use of alkali cleaners than in plating, as it is not usually important to maintain a polished surface, even on articles that may have such when submitted for coating; therefore harsher chemical action, or mechanical treatment, may be resorted to for cleansing than is usual for electro-plating only. After cleaning and thorough rinsing in clean water, the work is dipped in a soldering flux (usually a saturated zinc chloride solution made by dissolving zinc in muriatic acid), then into the molten metal, where it is submerged long enough to acquire the temperature of the bath, then withdrawn, the surplus metal removed by forcibly shaking, swinging or by centrifugal apparatus dipped in oil while hot (to prevent articles in bulk from adhering together), rinsed in solutions to remove the oil and oxides, if any (also to obtain crystallized effects when desired), and then dried. There are various modifications of and elaborations on this described procedure, and the electro-plater contemplating its adoption will do well to consult the various excellent articles available on the subject, as there are many details to be observed to obtain best and most economical results, and much of this will have to be acquired, along with a certain amount of manual dexterity, through experience and practice.

Cast iron, on account of the uncombined carbon, or graphite, in its composition, and on which the soldering flux has no action, requires other preliminary treatment before it can be successfully coated by this process. This preliminary consists of either removing the particles of uncombined carbon from the surface of the casting by combining it with the iron or surrounding substance in a muffle, and with the aid of heat, or by coating the casting with an intermediary layer of a metal that will adhere to its entire surface, and on which the soldering flux will act, or which may be used as a substitute for the flux. The first mentioned method will not be touched on here, as the latter is more generally applicable, is fully as satisfactory in almost every case, and consists of electro-plating with iron (by any of the well-known steeling solutions), zinc or tin (or even nickel for tin coatings, although this latter does not coat as smooth and bright as the iron). Zinc or electro-galvanizing should not be used as a preliminary for tinning if the color of the subsequent coating is of importance, as zinc mixed in the tin destroys its brilliancy.

On account of its ability to take any of the soft metal coatings with equal facility and best effect, as well as the economy with which it can be maintained and operated, the writer recommends the use of iron, except where it is required to coat with but one metal and its corresponding electro-plating solution may already be in use for other purposes.

In the cleaning of grey-iron castings for electro-plating with iron, even more care has to be exercised than with work to be coated direct, as all loose substances must be removed from its surface. It is also liable to have more silicon, or sand, to be removed than malleables, and where a sand blast is not available, and the work cannot be tumbled perfectly clean, a warm, hydrofluoric acid, standard solution pickle will be found preferable for the purpose.

The work should be left in this pickle just long enough to remove surface grease, sand, etc. (usually from 5 to 20 minutes, but with some work it may require several hours), then be well rinsed, and if the surface shows no traces of loose powder or dirt it can be at once dipped in sharp water, rinsed and hung in plating solution. If surface shows dirt, this will have to be removed by brushing or scouring, then proceed as above.

For plating the following solution is recommended: Sulphate of iron (first sorts and see that they are clean), 19 ozs.; sal-ammoniac, 14 ozs.; water, 1 gal. Use common boiler plate for anodes; the solution works best if warm, and requires about same current and other attention that the regular nickel-plating solution does. The novice will have some difficulty in determining whether the plating is progressing favorably on account of the similarity in color of the plate and its underlying substance. Care must be used to see that the work does not burn or blister, and the galvanizer or tinner who undertakes this function will do well to consult any of the excellent works on plating, or better, to get initial instructions in the art from an experienced plater, for, although the technicalities to master are but few, it is essential that they be well understood.

After the work has obtained a sufficient coat of iron remove from solution, rinse, and if the tinning or galvanizing outfit is conveniently located the work can be at once put through the flux and molten metal, and from here on be treated as for coating malleables, or steel, etc. If the plating is located at a distance it will be necessary to thoroughly dry the work, and when ready for dip-coating treat as for any other work, except that care must be taken not to use acids strong enough to remove the electro deposit.

When coating in same room as the plating operations, keep all traces of the oil away from the rinsing or pickling solutions used for plating; failure to observe this has been responsible for more disappointments in this line than any other one thing, and the tinner or galvanizer needs to remember that the plating solution will not burn off surface oils as his metal may, and the plater will have to remember that the molten metal is not an aqueous solution in which he can carry over any amount of rinse water with his work, as it will very forcibly resent any such attempts.

There are a number of uses to which this combination method can be put to advantage. Coated cast-iron work can be plated or treated for coloring exactly the same

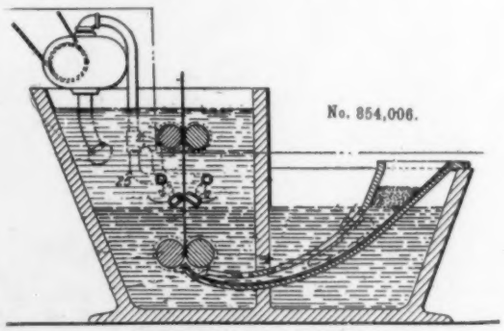
as the solid soft metals, and where such coated castings do not require sharper details than it is possible to get with iron, they are usually preferable.

Cast iron can be tinned or galvanized to match more expensive malleables, or to give the desired protection against wear, exposure to heat, or weather, that may be unobtainable by the electrolytic method alone.

The additional equipment needed by parties already performing either of the divisions of the combination is not great, as the cleaning outfit for either process will suffice for both, so that the tinning or galvanizing plant need add only a plating tank, solution and source of current for same, with necessary connections and anodes, and the plating establishment only a suitable melting outfit.

PROCESS OF TINNING OR COATING METAL SURFACES.

Patents granted to Lawrence C. Steele, of Pittsburg, Pa., May 21, 1907, describe a simple method of coating metal sheets in which the surplus metal coating is effectually removed. The idea is to pass the sheet through the molten coating metal and then apply suction at a point adjacent to the sheet and extending across the same



APPARATUS FOR TINNING.

while it is passing through the oil. The oil, being rapidly drawn across the face of the sheet, draws off the surplus tin with it. The suction applied across the plate is the same for its entire length so that the removal of the tin is uniform, leaving a substantially even coating on the sheet as it passes beyond the nozzles. At the same time any dirt or foreign matter is also removed. There is no waste of either tin or oil.

VISIBLE MIGRATION OF PARTICLES BETWEEN ELECTRODES.

At the tenth general meeting of the American Electrochemical Society in New York City in Sep'ember Carl trochemical Society in New York City last month Carl Hering read a paper on the above subject. The author described the behavior of minute particles of matter in a fluid placed between two electrodes when observed with a microscope.

It was found that these particles responded to the action of the current and traveled in one direction or the other. Occasionally particles of two kinds were found in one mixture, which moved in opposite directions. They seemed to exert a mutual repulsion as they deviated from their paths in passing one another. No attemtp to explain this was made, but it was thought that the phenomenon might account for irregularities occurring in electrolytic processes, particularly when oxidation occurs at the cathode or particles of foreign matter are found to be contained in the deposited material. The speed of these particles was about one foot in four hours.

It was thought by Dr. Bancroft that the phenomenon was simply a reversal of ordinary endosmose and the diaphragm, being disintegrated, could move as well as the liquid. And as there are two kinds of diaphragms, the particles of one would move in one direction and those of the other in the opposite direction. He was inclined to attribute this to local chemical action rather than oxidation at the cathode.

THE BRITISH ALUMINUM COMPANY.

The extraordinary general meeting of the British Aluminium Company was recently held in London. It was voted to increase the capital from £700,000 to £1,300,000 by the creation of 40,000 6 per cent. cumulative preference shares, and 40,000 1908 conversion shares, the first to be £5 each and the second £10 each.

The chairman explained that the demand for aluminum had for some time been greatly in excess of the supply, and although the company was pressing forward vigorously with the development of their large power scheme at Loch Leven, it would be a considerable period before those works would reach the producing stage. In order to obtain an increased production in the shortest possible time the company had acquired a partially developed power at Stangfjord, in Norway. Last year the company had also taken steps to develop speedily some 3,000 horsepower at Loch Leven, since this work could be performed without interfering with the general plans. It was stated that as one result of this movement the company expected to be producing aluminum in Norway in about three months' time and at Loch Leven in the autumn.

In addition to these minor schemes the company has purchased the concession for a partially developed water power at Orsieres, in Switzerland. The amount of power to be obtained there will be greatly in excess of that at Leven, and the cost per horsepower will be much less. The construction of the works at that site will proceed without delay.

The chairman explained that these new departures demanded a large capital expenditure. As to the result he said: "Our expectation is that when all these schemes are full developed, as is Foyers to-day, we shall have upward of 70,000 electrical horsepower per annum. As all the other aluminum producers on the Continent and in America are similarly enormously increasing the amount of power at their disposal, the existing famine in aluminum should be soon succeeded by a plethora of the metal. Such a change in the situation would undoubtedly lead to a material modification of the present price. Meantime we are enjoying a period of great prosperity."

ELECTROPLATED HOLLOW WARE FOR TRINIDAD.

Consul William W. Handley reports that nearly all the electroplated hollow ware sold in Trinidad is imported from England, the United States and Germany. England supplies the bulk of the trade for small, light-weight, well-made articles, which are chiefly manufactured in Birmingham. The trade seems to favor the English for its finish and lasting qualities, yet they suffer a drawback since they do not change their designs. Very little small piece American electroplated ware is sold there, our own market seeming to be confined to ice pitchers and trays. It is stated that these two articles can be imported from this country 20 per cent. cheaper than from either England or Germany. The Consul thinks the best way to increase the market is by means of salesmen.

A NEW BRITISH METAL.

(By Our British Correspondent.)

The well-known firm of Charles Clifford & Son, Ltd., of Fazeley Street Mills, Birmingham, Eng., have made several new departures of late, and are making a specialty of their bronzes, especially of manganese, phosphor, aluminum and silicon bronzes. The high price of metal has apparently affected selling rates in America to a larger extent than in England, with the result that some United States dealers have found themselves able to purchase very advantageously the Birmingham products. Among the articles turned out by this firm are copper and brass sheets, tubes, wire and rods, the precious metals, silver being also dealt in.

But the most important development of all is the recent production by this firm of a new white metal. The necessity for this has been brought about by the extremely high price of copper. The peculiar alloy which has been used to produce this metal is, of course, a secret, but the product has many merits. The firm's tests of the metal show a tensile strain of 22 tons, with an elongation of 15%. It has an exceptional surface, which enables it to take a white polish. It is almost as white as silver, and as there is no iron in it there is no liability to rust. The metal can be sold in the rod form on the basis of 6d per lb., or in the sheet form at 7d per lb. The firm have laid themselves out to produce this metal in large quantities, and they are anticipating a large demand from users who are feeling the pinch of these extremely high prices. The metal has been named "Seacliff," which is an adaptation of the registered design of the firm, consisting of a lighthouse standing out conspicuously over a rough sea at a short distance from a great overhanging rock. Samples of the iron can be seen both in a polished and in an unpolished form. The number of uses to which it can be put are great. It would seem to be suitable for articles so widely different as bolts, nuts and engraving plates. A representative of THE METAL INDUSTRY who visited the works was shown a piece of the plate as it came from the roll in an unpolished state. It had a beautifully smooth surface, and when polished it entirely deserved the "silver-like" description applied to it by its inventors. It seems to be a very manageable metal, and takes a screw thread remarkably well. It should turn well on the lathe also. It seems likely that "Seacliff" will enter into the composition of cycles and motors, as one large Midland firm have expressed themselves highly satisfied with it and propose to put it to a variety of uses. Many firms are testing the metal in various ways.

The firm do an enormous business in railway material, and there are a great variety of uses in the way of engine and carriage equipments to which the metal can be put.

The works are among the oldest in Birmingham, going back to the year 1740, but in many ways the place is remarkably up to date, and the latest discovery seems to have anticipated a special requirement in a remarkable way, though it seems likely that its far-reaching results will continue long after the special circumstances which brought into existence the new metal have passed away.

The disintegration of aluminum alloys was called attention to in *The Aluminum World* of June, 1902, page 175. It is only in certain mixtures that this phenomenon has been noticed.

MANUFACTURE OF LEAD SHOT.

The tearing down of the ancient shot tower at 82 Beekman street, New York, which had been a landmark for years, was the subject recently of an interesting description by the New York *Sun*, on the history of the tower and the manufacture of shot. We herewith make the following abstract and append a note by our lead expert:

"The tower arose above surrounding buildings 150 feet and was kept in active operation by the present owners, the Colwell Lead Company, until May 1.

"The necessity for the tower arises from the fact that molten lead must be dropped a long distance to make shot round and perfect in shape. It is an old-fashioned method, but it does not seem to have been improved on. The lead is first melted and tested and then it is run out into bars and transported to the top of the building. There it is melted again and poured through colanders, which are either hollow hemispherical iron disks or rectangular, flat sheets, each one perforated with a set of holes of uniform size, made perfectly smooth and exact. The lead when poured must be of the proper temperature for the special size to be made and the workmen are careful to keep a film of oxide as a lining to the colander, which is thought to improve the roundness of the shot, possibly by expediting its cooling while it is passing through the air. The holes vary from 1-50 to 1-360 of an inch, but the shot are of larger diameter than the holes. In falling to the base of the tower the particles of semi-fluid lead, acted upon alike over their whole surface by the current of air, assume the globular form, and by the time they reach the bottom they are sufficiently hardened by the cooling to resist the shock of striking the surface of the vessel of water placed to receive them. Large sized shot require a greater height than the smaller, and for the latter towers no higher than 100 feet are required. The tallest shot tower in the world is said to be in Villach, Carinthia, the structure being 249 feet in height.

"Taken from the cistern of water into which they have dropped, the shot are dried and then assorted according to their sizes by sifting them in a revolving copper cylinder set slightly inclined and perforated with holes, which increase in size toward the lower end. The smaller sizes thus drop through above and the larger ones lower down and each size is received into its own box. The shot get their superficial finish by being revolved for some time in a cylinder with pulverized graphite. Imperfect shot are separated from the truly spherical by allowing all to roll down an inclined plane. The perfect ones run straight down the middle, while the imperfect work off to one side or the other.

"A method of making shot without high towers has been patented in this country. The substitute for them is a low elevation, upon which a powerful current is blown, thus producing the effect of a long continued fall. Still another method is by pouring lead upon a revolving table on which is placed a cylinder of perforated sheet brass. The lead is thrown by centrifugal action through the perforations in the sides, forming round, brilliant shot, which strike against a linen screen placed to intercept them."

In regard to making lead shot, the method described above is correct, but the lead used contains about one-half per cent. of arsenic, which is added as arsenic, arsenic sulfid or arsenious acid (white arsenic). Too much arsenic tends to flatten the shot; too little will make it longish. Instead of the shot being rolled with graphite, it may be dropped into a very weak solution of sodium sulfid, which puts a thin film of lead sulfid on the metal and serves the same purpose as the graphite.

LEAD EXPERT.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE NON-FERROUS METAL INDUSTRY.

THE S. H. CRUCIBLE FURNACE.

Last month we had an interesting article, page 145, on the S. H. crucible manufactured by the J. W. Paxson Company, of Philadelphia, Pa. We now have the privilege of presenting an engraving of this furnace. On top of the furnace will be noticed a crucible feeder which is simply an old crucible with a hole in the bottom, placed

THE S. H. CRUCIBLE FURNACE.

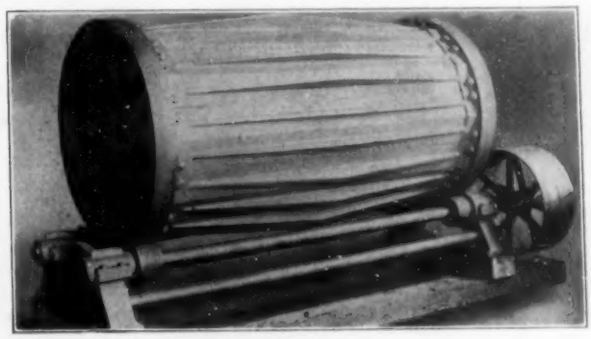
over the melting crucible. By doing this it doubles the capacity of the furnace, melting two pots of metal at the same time. The flame passes through the upper crucible and the metal therein drops in a sluggish hot stream; by this means the lower crucible maintains its heat and the metal is fed to it without chilling. We have published the tests of this furnace in previous issues and the builders are ready to furnish further particulars.

MACHINE FOR PERFORATING STRIPS OR SHEETS.

Patents issued to David A. Ritchie, of Cambridge, Mass., April 2, 1907, relate to an apparatus for perforating long metal strips in which it is desired to form holes separated from one another by uniform spaces. The machine has a plurality of dies which are moved toward the strip to form the holes which are less in number than the number to be formed in the finished strip. After punching one series of holes the dies are removed out of the way to permit the strip to be shifted for another series of holes. Provision is made for controlling the distance the strip can be moved after each punching operation. The strip is therefore properly positioned with relation to the dies to insure the holes being formed at substantially equal distances apart throughout the length of the strip. Provision is also made for initially positioning each strip with relation to the dies, so that the holes in different strips may be located at the same distance from the front ends. The strip is automatically fed to the machine.

THE MOUSSETTE RUMBLING BARREL.

The new rumbling barrel just brought out by O. J. Moussette, Driggs avenue and North Tenth street, Brooklyn, N. Y., is a self-contained machine in every sense. It has no gears or pinions to break or wear out, and the inside of the barrel has no bolt heads projecting to interfere with castings. All the bolts for fastening the staves are very easy to get at. As the barrel runs on rollers very little power is required to operate it. It is so made that any of the staves may be taken off for



MOUSSETTE RUMBLER.

filling or emptying. All the bearings are on one frame, thereby keeping the machine always in perfect alignment. Durability is assured, as the barrel is carried upon four bearings.

THE PITTSBURG DOUBLE SWIVEL VISE.

After years of experimental and practical tests the Pittsburg Automatic Vise and Tool Company, of Pittsburg, Pa., have perfected their double swivel vise which is now placed upon the market. It may be turned and locked at any angle in two complete circles. The vise is composed of only eight parts—the screw, front and rear jaws, two yokes, female screw, friction plate and base. The base is formed with an annular seat for the body. The latter consists of two halves or yokes, each provided with a half of a hub seated in the base, so that when they are drawn toward each other at their top they will be pressed outward below and thus locked frictionally in the base seat. The rear jaw can be rotated about its axis within the body of the vise. It has two diameters, the larger one working in the front yoke and the smaller one in the rear. The friction plate is fixed to the outer extremity of the jaw member. This cap bears against the outer edge of the rear yoke and serves as a support and bearing for the sleeve or nut. The latter has a head which bears against the outside of the friction plate and extends through the same into the internal bore of the front jaw. A special bearing sleeve

is placed on the screw between the head and fixed collar; this is designed to be forced tightly upon its seat in the front jaw so as to serve as a backing for the collar when the screw is rotated to open the jaws. It also gives the head of the screw a solid bearing against the full stock of the front jaw; there is therefore nothing to break or give way under severe strains through the action of the screw. When the screw is tightened it tilts the body

PITTSBURG DOUBLE SWIVEL VISE.

sections toward each other and locks them against rotation of the base. The jaw faces are of tool steel and the screw is a hammered steel forging. Since the jaws can be revolved in any direction there are really two vises in one; for if a smaller vise is wanted than the jaw faces, the jaws are simply thrown to one side and the side of same used. If a stationary vise is desired the thumb screws on the rear can be tightly turned and the two swivels locked.

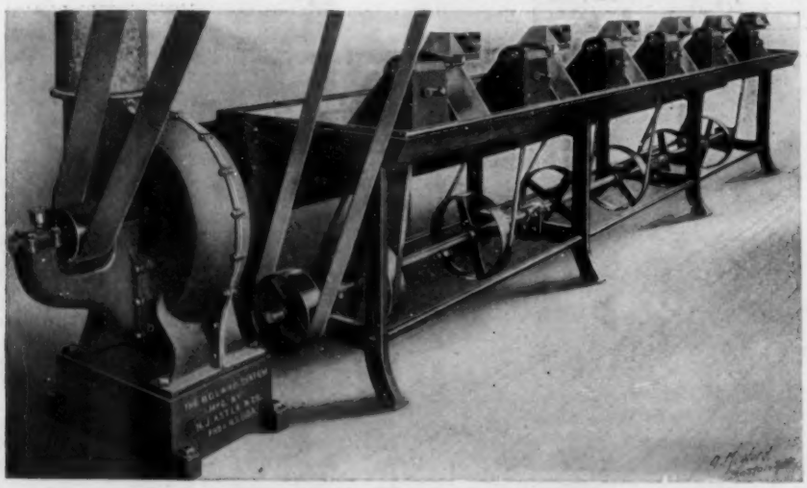
THE BOLAND POLISHING BENCH AND BORACIC ACID OUTFIT.

H. J. Astle & Company, of Providence, R. I., have designed a number of specialties for the use of manufacturing jewelers, silversmiths, metal workers and platers. One of the requirements of all shops which work the precious metals are appliances for collecting every particle of scrap from these metals. By the arrangement of the polishing benches shown in the cut a compact and convenient arrangement is provided which accomplishes this object very perfectly. Extending along the back of the table is a duct leading to an exhaust fan which draws the dust into a water sprayed tank, thereby collecting this residue for refining, while the air of the room is relieved of dust. The benches are of wood, zinc lined and iron legs and have self-oiling boxes.

A neat and handy appliance for using boracic acid is another specialty of the company. This outfit is heated by steam which is stated to be an improvement upon gas. It prevents the metal goods from being covered with

BOLAND BORACIC ACID OUTFIT.

dust and is altogether a convenient and efficient device. The object of dipping in the boracic acid is to prevent oxidation after annealing the articles, thus retaining the bright finish.



BOLAND POLISHING BENCH.

Consular reports of April 30 state that a mercantile firm has a sample set of brass dishes which purports to be the table dinner set of a Korean gentleman. The concern writes to the Bureau of Manufactures that it has a tentative order for 50 sets of these dishes to be made in aluminum, and desires to hear from manufacturers in the United States who would be interested in supplying them. The sample set weighs about 15 pounds and consists of 15 pieces, each with a tight fitting cover.

PNEUMATIC SPRAYING OF LACQUERS, PAINTS, ETC.

The Eureka Pneumatic Spray Company, 92 Lafayette street, New York City, report that they have interested many new fields in their method of applying lacquer, enamels, etc. They have succeeded in doing work which has been difficult with either the brush or dip process, particularly in the manufacture of collar and sleeve buttons. Articles like this are usually carded and require a coat of lacquer to prevent tarnishing. The Eureka Company do this work by placing several gross of buttons on a tray or screen and spraying the lacquer over the tops of all of them at once. This operation consumes only a few seconds and the tray may then be set aside to dry, when the buttons are handed to the carders in the regular manner.

PNEUMATIC SPRAYING OF LACQUERS, PAINTS, ETC.

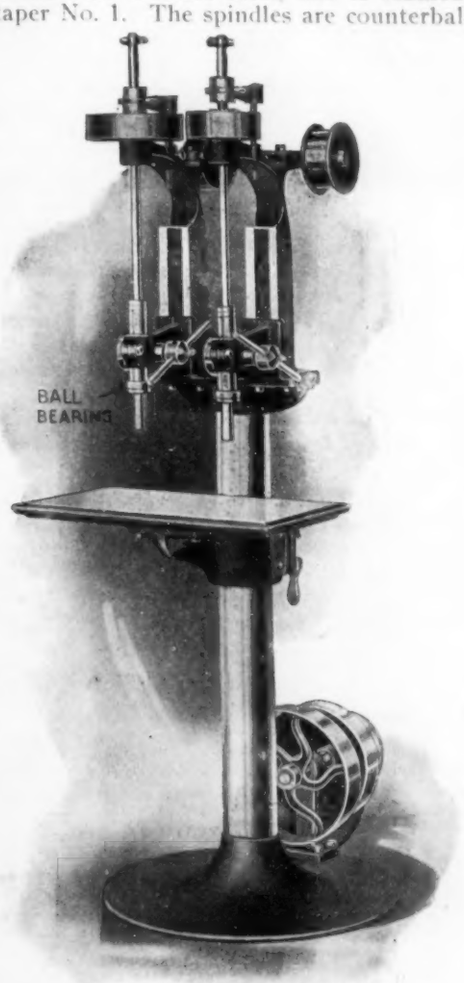
It is quite a jump from the lacquering of buttons to the painting of structural iron work, bridges, tunnels, etc., but the Eureka machine, in its different sizes, is capable of covering as wide a range of work as this. The illustration shows ordinary paint applied to girders before erection. The work is rapidly done and the machine keeps the red lead paint stirred while using. On structural work it is more valuable as the paint can be blown into all joints and crevices.

American Consul-General J. P. Bray, of Melbourne, states that owing to the adulteration of white lead imported into the Commonwealth it is expected the government will, at the next session, raise the import duty from the present $10 a ton to $15 or $20 a ton to enable a local company to resume operations. The importations are from England and Germany. The local product is said to be pure white lead, made by a patented chemical process requiring less time than by the old method.

A bulletin issued by the U. S. Geological Survey states that from 1821 to 1907 the total lead production of the upper Mississippi Valley was sold for approximately $50,000,000.

SINGLE AND MULTIPLE DRILL PRESSES.

The Francis Reed Company, of Worcester, Mass., are building a series of small drill presses, in single and multiple spindles, which possess many admirable features. In the two-spindle machine which is here illustrated the countershaft is placed at the base of the drill, thereby removing all jar caused by unevenness in the belt. This system of belting imparts a perfectly steady motion to the spindle, and the belts being long give great power, while running quite loose. The tension of the belt is never on the spindle. The quill has steel rack and pinion. The spindle is made of the best crucible steel, and is reamed with Morse taper No. 1. The spindles are counterbalanced



THE REED MULTIPLE DRILL.

with a coil spring which can be adjusted to any degree of sensitiveness. The spindles in the two-spindle press are 8 inches apart and are driven by an endless belt 2 inches wide. Each spindle has an independent stop motion, which enables the operator to stop or start the spindles without stopping the machine. Stop collars for drilling to depths are furnished, also collars to stop the spindles from rising higher than necessary. The table is counterbalanced by weight inside the column, and is free to swing either way. The largest drilling capacity is ⅝-inch.

Consular reports from Sydney, Nova Scotia, under date of May 31, 1907, state that a manufactory of brass goods, with a capital of $100,000, is to be started immediately, producing various classes of articles suitable for offices, car, plumbing, steam and general use.

EDITORIAL

OLD SERIES VOL. 13, No. 6. NEW YORK, JUNE, 1907. NEW SERIES VOL. 5, No. 6.

THE METAL INDUSTRY
THE CONSOLIDATION OF
THE ALUMINUM WORLD
THE BRASS FOUNDER AND FINISHER
AND
ELECTRO-PLATERS REVIEW

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JOURNALISM AND JOURNALISM.

According to the old and well defined rules of daily newspaper conduct, accuracy of report was the first consideration, and upon that foundation of truthfulness the newspaper structure was erected. Most of the daily papers of New York City still follow the custom of verifying statements brought to them, but, certainly and unfortunately, there are others which have thought of the fate of Ananias without a shudder. This latter class loves to say the thing that is not so, provided the saying will bring out the yellow streak more glaringly; a few untruths, carefully selected and judiciously disposed, will not harm a confiding and ignorant public.

But there is one indictment to which the daily press of this city, practically without exception, must plead guilty. They are gullible when it comes to scientific or engineering subjects, no matter what branch of engineering may be under consideration. The inaccuracy with which they treat a technical question is proverbial. The proof of this is evidenced by the fact that there is not a technical or trade paper in this city that will publish an unsigned account of any engineering event, or the description of any mechanical device, whether it be a fly catcher or power station, that appears in a daily paper. The editor who might want to use that article, will be sure to find a slip, either a word or phrase, that shows the reporter is trying to tread a field entirely strange to him. The only service the technical editor gets from the daily press is in the shape of hints—from what he learns of the event or appliance it may be worth his while to work up the subject for his own readers. But he will not transfer the report to his own columns, except perhaps to poke fun at it.

A short time since a well known technical writer sent an account of the machine for sinking screw piles used in the Pennsylvania tunnel, to one of the morning papers. When the editor got through with that article and it appeared it was a marvel of muddy lucidity. But the artist who put the filagree work around the photos was the real genius. To further illustrate the great power of the machine he drew a locomotive suspended in the air by chains; this was not designed to indicate the power of the engine, but just to hint at the power behind the screen that lifted the engine. It was a fine drawing, with the single exception that the port cylinder was a trifle short and the first stroke would knock its head off; except for this little defect it was a nice portrait of a modern locomotive. But the real inspiration was in the arrangement of the chains holding the thing up—they passed through the cab windows. Sixty or 80 tons rested quietly and there was not a wrinkle in the cab surface to show that it had any

extra load upon it. But little things like this could be overlooked when the real beauty of the whole was considered.

When the editor was taken to task for the unique collection of untruths he had infused in a column article he merely said: "Our readers won't know the difference." That was his conception of the duties and responsibilities of an editor of a great daily.

We recollect one daily paper report that was accurate in every way. It was a description of the battleship Oregon. The reporter began his article with the statement that he knew nothing of battleships or their machinery; he proved the assertion in two columns of very readable stuff.

Anyone will do to report an engineering convention or the opening of a power station; but only an expert must be assigned the task of describing a bride's trousseau or attend a fisticuff exhibition.

The poor reporter is blamed for all these little blunders, but once in a while Jove himself enjoys a nap and the editor falls off his perch. The last case was only about a month ago, when one of the eminently staid and reliable New York dailies had a circumstantial report that Sir William Ramsay, the eminent chemist, had succeeded in producing copper by subjecting sodium, lithium and potassium to radium rays. The work was easy. This course yielded copper sulphate, and with plenty of this on hand every chemist would know how to throw down the copper. The despatch announcing the discovery appeared from Baltimore, and many of the professors of Johns Hopkins were brought in, directly or indirectly. The reporter who sent it to New York had evidently heard of the saying of the wise man—perhaps it was Dean Swift—who made the remark: "When you lie, lie circumstantially." This the reporter did, as his article is embellished with many pertinent details. He even points out the commercial value of such a discovery and the influence it will have upon the copper mines of the world. The reporter does not forget to mention that this is the biggest thing that ever invaded the field of chemistry.

The editor of that daily was fooled, but his report failed to find a single technical editor even a little drowsy. Stories of the transmutation of metals are quite too exciting to be appreciated by those whose business leads them along matter of fact highways. And yet with the advancement now taking place every day in every branch of the scientific world, it does seem passing strange that the daily paper only notices events enough to present them in a more or less garbled fashion.

THE BRASS ASSOCIATION.

The American Brass Founders' Association is a fact—organized by 100 representatives of the brass interests with enthusiasm and confidence, two elements which mean success. We are pleased to publish in this issue a complete report of the proceedings and now it devolves upon every one who is interested, from the chief officer to the lay member, to put their best foot forward in creating an interest and getting recruits for the new society.

It is unnecessary for us to speak of the benefits that have been derived from the American Foundrymen's Association, with which society the new association is allied, nor is it necessary for us to repeat the benefits derived from technical societies in general. Every intelligent man now recognizes them and their necessity. The iron interests have had their various societies for years and now the brass men will have a chance.

We also congratulate the new society on the representative officers which have been chosen for the first year and we wish to say just a word how, in our opinion, these officers can aid in progressing the cause. Of course, it is understood that a great deal depends on the president, secretary and treasurer, particularly the secretary, but the vice presidents, who, with the officers mentioned, constitute the Executive Board, can take no small part in furthering the society's interest. These vice presidents have been selected geographically, that all sections of the country may be represented and by making an active canvass in their respective territories for members they will prove that a vice president has real and active duties besides being an honorary figurehead.

The president of the association looks forward to a membership of 500 when we meet next year at Toronto, Canada, and we fondly trust that these hopes may be realized and believe that they will if every officer keeps in mind during the year the cause of the American Brass Founders' Association.

ELECTRO-METALLIZATION.

In this issue we publish a most interesting communication from L. G. Delamothe on the subject of "Electro-Metallization." Also we reproduce, as well as a camera can reproduce, an oak leaf in bronze, for with all due respect to the camera it cannot give the beautiful coloring and tinting that is on this leaf, once green, now bronze. It must be seen to be appreciated. This oak leaf is only a slight example of the possibilities in electro-metallization. As Mr. Delamothe says, it is not a new art, dating back from ancient times to the Egyptians and from modern times to Jacobi, 1837, but at the present time no great commercial use is made of this art. He explains this lack of use to the fact that most platers or chemists are not experts enough in finishing. He is now engaged in reproducing in metal all the beauties of nature of such a wonderful variety.

It takes no great stretch of the imagination to appreciate the possibilities of the metallizer's art. What could be more beautiful for interior decoration than bronze oak leaves, silver rose buds or golden pinks with the tinting which is at the command of the platers' art? Also what could be nicer, finer or more elaborate for trimming women's hats than metallized flowers and leaves? No bird life would be destroyed in electro-metallization millinery. Therefore it would have the approval of the Audubon Society and all others who believe that birds have another purpose than to ornament ladies' headgear. In citing these few uses for the electro-metallizers' craft we have scarcely touched upon the variety of purposes to which the art can be applied. As Mr. Delamothe concludes in his observation, "it is to the plater and to the artist to develop this electro-metallization process and for selling departments of the art producers to make known throughout the country its usefulness.

CRITICISM AND COMMENT
WE CORDIALLY INVITE READERS' OPINIONS AND CRITICISMS OF ALL ARTICLES
PUBLISHED IN THE METAL INDUSTRY. SUGGESTIONS WELCOME.

ACID COPPER SOLUTION.

To the Editor of THE METAL INDUSTRY:

In regard to the request that we made about the acid copper solution, the answer of which you published in your May number, we were able to locate this trouble by taking 20 gallons from our 100 gallon solution, filling it with water and adding 25 pounds of blue vitriol, giving the solution a great deal more metal and in this way reducing the acid. The trouble was too much acid for the amount of metal, which caused the bright appearance rather than the velvet or mat finish desired. We thought possibly this remedy might be interesting to you or your readers who are constantly asking questions of this kind.

May 20, 1907. M. W. CARR & Co.

We thank M. W. Carr & Co. for writing this letter, which no doubt will prove interesting and of value to many platers, and we trust that the example of their willingness to give information as well as to receive it will be followed by others.—EDITOR.

ALUMINUM FRICTION CLUTCHES.

To the Editor of THE METAL INDUSTRY:

Aluminum friction clutches have certain characteristics of peculiar value for the purpose. Aluminum has been used to a small extent for this purpose and has given eminent satisfaction. I refer to shoes on the periphery clutch such as is most frequently seen on a line shaft pulley, and it has also been successfully used for face clutches, which I believe are the ones used in automobile drives.

Aluminum has a very high friction indeed and consequently makes a very sure clutch. Its wearing qualities have also shown up remarkably well under such conditions.

For face clutches I would suggest the use of a pure hard grade of aluminum as being most satisfactory. For cast shoes I would suggest the use of a light alloy, say corresponding to the No. 12 alloy of the Aluminum Company.

G. R. GIBBONS.

ELECTRIC CLEANER.

To the Editor of THE METAL INDUSTRY:

During the past 6 months I have used an electric cleaner solution which is ahead of anything I have used before, both in maintenance, cost and cleaning qualities. It is made by using 20 pounds Roberts potash to 100 gallons water. It is used boiling hot and is run the same way as a plating tank (work on negative pole, tank positive), using 8 volts. To keep the surface of the work bright I added 6 ounces potassium cyanide, and a few ounces each week. An excess of cyanide must be avoided on account of dissolving the plated brass or bronze on the racks and depositing it on the work.

I find the gas given off from the articles throws the oil and grease sufficiently far that by taking the work straight out of the bath, quickly, there is no danger of the articles becoming covered again. Of course, I skim it off occasionally. This cleaner is doing the work that four boys did formerly scrubbing.

E. S. HEMSE.

May 25, 1907.

NEW BOOKS.

A Study in Graphite is the title of a recent booklet published by the Joseph Dixon Crucible Company, of Jersey City, N. J. It gives in detail a series of tests of graphite made by Prof. W. F. M. Goss, of Purdue University. These tests were not made with a view of determining points for or against graphite, but were conducted in the spirit of scientific research to ascertain the true value of graphite as a lubricant. The opening pages are devoted to a discussion based upon conclusions drawn from the results of the tests. Then follow complete descriptions of the tests, together with illustrations of the testing machine. The condition of the bearings and journals is shown by photographs taken at different stages of the tests. Graphite is unlike oil in that it does not to any great extent form an intervening film between the rubbing surfaces; but it associates itself with one or the other, or with both of the surfaces. It enters every crack and crevice in the surface and fills them. If the surfaces are irregular, the graphite fills in and overlays until a new surface of more regular outline is produced. It is for this reason that graphite constitutes such a true lubricant.

ELECTRIC FURNACES FOR THE FOUNDRY.

Dr. Richard Moldenke contributes to the *Electrochemical and Metallurgical Industry* an interesting article in which he advocates the employment of the electric furnace in the foundry. Speaking of the induction furnace the writer states that it seems to fill the requirements and "I would like to see more work done along this line for the foundry. I may be in error, but it would seem to me that scrap of all kinds, properly selected, is all that need be melted, cleaned by some ferro-alloy, and then cast in the usual way. The enormous steel production will always yield scrap enough to supply the demand for small steel castings, once a process of this kind can be made to work commercially, and I would be very glad to be of assistance in bringing a process of this kind to the attention of the foundry world.

"Taking the non-ferrous metals. A brass foundry would have abundant use for an electric melting process if run on the lines laid out above. The melting loss in the brass foundry in zinc and tin is a great one, and one that runs up into money quickly. A clean, wasteless process, as the electrical one should be, would be a boon to the industry. There are many foundries which could melt within short periods of time during the day or night when their plant is not used for its regular purposes. Hence only the electrical apparatus proper might be required, the necessary power being available."

The search for tin deposits is very energetic at the present time. Even the old shafts, tunnels and dumps which are scattered all over the Erz Mountains, both in Saxony and across the border in Bohemia, are being carefully examined by experts sent out by the Saxon and Austrian governments, and by private individuals.

CORRESPONDENCE

IN THIS DEPARTMENT WE WILL ANSWER QUESTIONS RELATING TO THE NON-FERROUS METALS AND ALLOYS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

METALLURGICAL.

Q.—Enclosed we hand you sample of metal which we are using at the present time in the course of manufacture. This metal is made of the following mixture:

170	lbs. Lead	= 67.32%
70	lbs. Tin	= 27.72%
9	lbs. Antimony	= 3.56%
3½	lbs. Copper	= 1.40%

As you will note, at the present market price of metals this makes a rather costly alloy. We wish to produce a substitute that will cost less, but will have the same qualities as regards color and strength. Can such an alloy be made?

A.—It would seem that the tin in this mixture could be somewhat reduced and the hardness and color retained by omitting the copper and increasing the antimony. As the tin is reduced the alloy, of course, will not be so fluid when melted, but if it is thoroughly fluxed and refined it ought to run fairly well.—J. L. J.

Q.—Please give us some information about air furnaces for melting brass scrap. These we presume would be upon the style of the ordinary air reverberatory furnace, but we believe there are some plans that are especially adapted for melting brass instead of iron. We expect to use soft coal as fuel, possibly in combination with oil combustion.

A.—If the scrap is clean it can best be put into ingot form in the crucible or Schwartz or Rockwell furnaces, and the melting loss will be from 2 to 6 per cent., depending on the composition of the metal. If the scrap consists of iron and brass parts, or brass and steel turnings so interlocked that they cannot be separated, a reverberatory furnace with a sloping hearth may be used. The brass melts and runs down the slope into the crucible or tapping out part of the furnace, while the unmelted iron and steel may be raked out through a door in the side of the furnace provided for that purpose. A furnace utilizing this principle is made by the Lawrenceville Bronze Company, of Pittsburgh, Pa., and several of them are in use by H. M. Shimer & Co., of Philadelphia, Pa. The melting loss in the reverberatory furnace is from 10 to 15 per cent., and when used for melting scrap brass it should be supplemented by a water jacketed cupola for recovering short metal from the slag.

Q.—How can I melt a small quantity of silver, say 10 or 12 ounces?

A.—Procure a small graphite crucible, one that will hold a quart. Prepare a fire that will bring the crucible to a red heat and place your silver therein. At the same time add 2 or 3 ounces of carbonate of soda (washing soda) as a flux. Stir with an iron rod, and when thoroughly fluid pour into a mold made from iron or clay, thoroughly dry, to produce an ingot.

Q.—Will you kindly tell us a good acid metal mixture, as we have an order for some work that requires that metal?

A.—Acid metal mixtures are, as a rule, difficult to smelt into a uniform ingot. A mixture of copper 75 and antimonial lead 25 is perhaps as easily handled as any. You will save time and money by obtaining some good acid metal, such as the Ajax plastic bronze, in ingot form, and making your castings from it.—J. L. J.

Q.—I am greatly in need of a cheap formula for casting small forms in gray iron molds. Could you suggest some cheap white metal that will run good and give good sharp casts?

A.—If your castings are not too light in section you will find antimonial lead a good and cheap metal to use. For work that is light and difficult to run, a metal high in tin must be used, unless the casting is done under pressure, and then alloys of zinc may be used.—J. L. J.

Q.—Will you please give me the formula for a good but low priced grade of phosphor bronze to be used for bearings?

A.—The very best formula for phosphor bronze bearings that can be used is:

Copper	78
Tin	10
Lead	11
Prosphorus	1

If less than 1 pound of phosphorus is used the metal is not thoroughly deoxidized, especially if scrap copper wire has been used. Instead of the phosphorus, 5 pounds of Royal phosphor copper may be used and the proportion of copper reduced to 73 pounds.—J. L. J.

Q.—In a recent issue you published an alloy of 95 parts of Bertha spelter and 5 parts aluminum. We tried this, as we have some trouble with pure spelter in casting our art figures in bronze molds. We got excellent results as to castings, but find we cannot solder the different parts together.

A.—Richards' aluminum solder (Delaware Metal Refinery, Philadelphia, Pa.), if used according to directions, will probably overcome your trouble. This solder is said to consist of tin 29, zinc 11, aluminum 1, and 10% phosphor tin 1.—J. L. J.

Q.—(1) At what temperature, C, should copper wire be annealed? (2) At what temperature should the ingots be heated before rolling?

A.—(1) Copper wire is annealed at a temperature of from 1,500 to 1,800 Fahr., corresponding to 816 and 962 Cent. This temperature varies somewhat, being dependent on the size of the wire to be annealed and the temper required. (2) Copper ingots are heated to a bright red before rolling. Although we cannot say positively, we have been informed that the furnace temperature is in the neighborhood of 2,000 degrees.—A. W. L.

Q.—I would like to know the mixture used in straw hat factories for making hat forms. I understand it contains zinc and other metals.

A.—Some manufacturers use galvanizer's zinc dross for this work very successfully. The metal is mushy and thick if not heated too much, and can be pressed into any shape or form. The forms can also be made from plaster.—W. J. R.

Q.—I am very anxious to find a non-corrosive metal; that is, one which will not be affected by the weather any more than brass or bronze. The metal, however, must approximate steel in hardness and be one which cannot be easily sawed or broken. In other words, I want to find a metal which could be used for making chains, etc., for outdoor use, which would be reasonably secure against cutting or breaking and yet would not rust.

A.—Manganese bronze would probably come as nearly as any non-ferrous metal to meeting your conditions. It casts well, but some trouble has been experienced in brazing it, because its melting point is not much higher than that of ordinary brazing solder. Some of the high nickel alloys, such as Constantan, Monel metal, etc., might be tried, although they are essentially rolling rather than casting alloys. They are non-corrosive and have the requisite strength and ductility, and could be welded electrically or by the acetylene-oxygen autogeneous soldering process.—J. L. J.

Q.—Will you give me some information in regard to so-called mirror metal, an alloy which is used to make optical mirrors. What I wish to know is, where I can get such metal if it is a commercial article.

A.—The so-called mirror metal consists of 13¼ ounces of copper, 1½ ounces of lead and 1¼ ounces of antimony. The antimony may be replaced by arensic.—J. L. J.

Q.—Enclosed we hand you sample of metal which we are using at the present time in our manufacture. This metal is made of the following mixture:

Lead	170	lbs.
Tin	70	lbs.
Antimony	9	lbs.
Copper	3½	lbs.

As you will note the present market price of metals, this makes a rather costly alloy. We wish to procure a substitute that will cost less, but will have the same qualities as regards color and strength.

A.—The formula you submit is an unusually good one as regards color and strength. We doubt if you will be able to obtain an alloy of this nature that will give you as good results. We suggest the following mixture, but cannot guarantee as good results as you now obtain, but it may be worth a trial:

Lead	160	lbs.
Tin	30	lbs.
Antimony	12	lbs.
Copper	2	lbs.

J. L. J.

PLATING AND FINISHING.

Q.—Kindly advise us as to the best way to handle galvanized iron radiators to be oxidized copper finish. We have had trouble with white spots something like a salt which appears after the work has been finished and lacquered. The radiators are pressed steel and galvanized by the hot process.

A.—If you are satisfied that your work obtains a uniform deposit all over, then your trouble must be due to imperfect washing after depositing the copper. The crevices may be somewhat porous, or small fractures may be produced by the stretching during pressing. The solution penetrates these minute cavities, forming cyanide of zinc, which oozes out and produces the white spots. The same action causes like trouble in cast iron, due to its porosity. We would advise you, after coppering, to thoroughly boil the radiators in a solution of plater's compound, 2 to 3 ozs. to the gallon. This will necessitate afterwards a slight immersion in the potash bath and cyanide before the regular oxidizing takes place on account of the slight greasy film resulting from the compound.

Q.—Kindly give me a verde antique finish on plain brass surface.

A.—Dissolve ½ lb. sulphate of copper and ½ lb. sal ammoniac in each gallon of hot water necessary for immersing the articles. The surface of the articles should be deadened by means of a brass scratch brush and pumice stone. (See the article in the April number of THE METAL INDUSTRY for a brush brass finish.) Immerse the articles in this solution for 2 or 3 minutes; this will produce a dark bronze effect. Do not wash the articles, but drain them well, and when nearly dry stipple them with a solution composed of carbonate of copper 1 oz., water ammonia 2 ozs. This should be mixed first. Then add 30 ozs. of water by measure. Use a brush known as a painter's sash tool for stippling. After this operation allow the articles to dry, when they will be coated with a variegated coating of copper carbonate. Immerse in a transparent dip lacquer. For lustre the articles should be waxed.

Q.—(1) What is "brown Montreal potash"? (2) What dip will produce a nice brown on brass?

A.—(1) Brown Montreal potash is the regular commercial lump potash known as first sorts. (2) The formula given in the March number of THE METAL INDUSTRY gives good results if the directions are carefully followed. The second operation produces the brown; if not dark enough immerse in a saturated solution of sulphate of copper—1 pound to the gallon—used cold. A very brief dip in this after the previous operations will give a chocolate brown. Try this formula also: Potassium nitrate, 4 ozs.; yellow sulphide of antimony, ½ oz. dissolved in 2 ozs. water ammonia, and hot water 1 gallon. Prepare the work as stated in the previous formula. This will give a Viennese bronze upon brass, either solid or plated, if the high lights are shown in relief by removing the bronze formation.

Q.—I have stumbled up against a new trouble. I find in plating heavy pieces of iron that it sweats out brown spots after it stands a couple of days. It is on stove work. I have traced it to the potash, but do not know how to get along without the potash.

A.—You do not state whether you nickel your castings direct or copper them first in a hot cyanide of copper bath after cleaning. In the first case it would probably be due to the potash; in the second these results would come from the porosity of the iron absorbing the cyanide of copper solution under the influence of the current. This, when sweating out, would produce the blemishes noted. In either case an immersion in a very dilute and hot solution of sulphuric acid, 1 or 2 degrees Baumé, for a few minutes after cleansing and washing, or after coppering and washing, would most likely assist. This would have a tendency to neutralize the alkali in the pores and should prevent the stains mentioned. The nickel solution would not produce these stains unless it was alkaline.

Q.—(1) I would like to have a dip to brighten brass without tarnishing the plate. (2) I would also like a good rose gold solution.

A.—(1) By the appearance of the sample submitted your acid dip contains too much water; build it up by adding 2 parts of aqua fortis and 1 part of oil of

vitriol by measure. In dipping blanks use an aluminum dipping basket in the acids. You can remove the acid much quicker than by the stoneware basket. A good dip for your purpose should consist of:

Aqua fortis	1 gal.
Oil of vitriol	1 gal.
Rock salt	6 ozs.
Water	2 qts.

Mix and allow to cool before using; when replenishing do not use more water; add equal parts of the acids by measure only. (2) A good solution for the rose gold finish should consist of:

Cyanide	1 oz.
Prussiate of potash	¼ oz.
Chloride of gold	12 dwts.
Sal ammoniac	1 dwt.
Water	1 gal.

The anode should be 14 karat gold, replaced occasionally with one of 22 karats. Use the solution at 180 degrees with a strong current.

Q.—I would appreciate it very much if you will let me have the recipe for depositing or plating copper on wood.

A.—In electroplating wood it is necessary that it be made impervious to water. That can be accomplished by immersing in boiled linseed oil, the excess of oil being removed from the wood and the wood allowed to dry somewhat. A thin coating of air-drying japan reduced with benzole is then applied, and while the surface is tacky, copper bronze powder is applied and well rubbed into the varnish. When thoroughly dry it is ready to be immersed in the acid sulphate of copper bath. This should consist of a solution of sulphate of copper in water equivalent to a density of 16 Baumé and increased to 18 degrees by the addition of sulphuric acid.

Q.—What is the cause of my anodes turning a sort of dirty black muddy color? This is in regard to oxidized copper plating of gas fixtures. And furthermore I wish to state that my work peels very badly at times.

A.—Your trouble is evidently caused by using a too concentrated solution. Do not run your solution over 10 degrees Baume for your work. If your solution is denser than this add water until it is sufficiently reduced. Add a small quantity of bisulphite of sodium occasionally. A too concentrated solution or an excess of cyanide will cause the deposit to peel.

Q.—How can I oxidize small ornamental objects of hammered copper? Also, after oxidation, should the articles be lacquered? If you are acquainted with other finishes, except verde, which I am using, which can be applied to small objects such as ash trays, match holders, candlesticks, etc., shall be glad to know of them.

A.—For oxidizing purposes use liver of sulphur in the proportion of from 1-10 to 1 oz. to each gallon of water. The solution should be used cold. In dilute solutions the red shades are produced; in the medium the brown or Japanese bronze, and in the strong the black or gun metal effects. A few drops of strong ammonia should be added to the solution. If you have facilities for power and can use a brass wire scratch brush you will be able to produce many artistic effects; this might be arranged for foot power. All oxidized finishes should be finished by dry brushing and then relieved to show the copper with powdered pumice stone, used with a piece of cloth or felt and water. Brush copper effects can be produced with the scratch brush, by using powdered pumice moistened with water and brushing lightly. This method gives the beautiful dead lustre seen upon lamps, chandeliers and gas portables. The articles should be kept moist while brushing, using water to which has been added a little washing soda. By using a dip silver solution to whiten the copper, relieving as directed and coloring in a weak solution mentioned, artistic effects can be produced equal to those usually found upon such goods. The articles should in all cases be lacquered either by dipping or brushing; this brings out the shaded effects and preserves and beautifies the finish.

Q.—I notice in a paper that a cleaning solution calls for brown Montreal potash and sodium hydrate; what is the common names of these? I would suggest that in giving formulas you give both the common and chemical names of the ingredients; this would be a great help to many of your readers.

A.—Brown Montreal potash is the common brown potash of commerce, also known as first sorts of potash. Sodium hydrate is the caustic soda of commerce. We thank you for your suggestion, and each month we shall try to give the chemical and common names of the materials used in connection with the electro-plating industry and its allied trades.

Q.—How can I produce on brass a color like pewter metal without using a tin or lead solution?

A.—By boiling in a cream of tartar solution containing a little chloride of tin and placing upon sheet while immersed; also by contact with zinc in a weak boiling solution of potash. These methods give a color resembling pewter upon articles made from brass.

Q.—Would the acid arsenic bath be suitable for oxidizing brass plated work?

A.—The acid arsenic bath produces an unusually hard deposit and might not relieve sufficiently for the purpose. By the addition of 1 oz. sulphate of copper to each gallon of solution a darker and softer deposit may be obtained that might answer your purpose.

Q.—(1) Kindly let me know if the ring here sent can be silverplated or nickeled. Let me know the method. (2) Would you be good enough to say how to lacquer iron rivets in brass color?

A.—(1) The ring submitted consists of aluminum and zinc. You may experience some difficulty unless you are very careful. We have nickelplated your sample. It can also be silver-plated by using the same method. First we polished the ring; then cleaned it in gasoline; then immersed it in a weak boiling potash solution, washed in cold water and passed through a cyanide cleaning solution and again washed. The oxide formed upon the surface was easily removed by a plater's hand brush. The ring was then immersed in a solution containing 3 ozs. cyanide of potassium, ¼ oz. yellow oxide of mercury and 1 gal. of water. Again washed and immersed in the nickel bath, first with a strong current. The results were very satisfactory, both in the silver and nickel. The only trouble experienced was in the removal of the oxide formed by the action of the potash bath. We send you the ring as a sample of the results obtained in our laboratory. (2) You cannot produce a satisfactory color upon the small wire nails by lacquering unless you tumble them with a little pale gold bronze powder which may give you the brass effect. We return your samples which we brass plated in woven wire baskets. This can be accomplished very readily with the aid of a dynamo, but unless you have this it is useless to try. If coppering would be satisfactory you can copper them by immersing in a solution containing 1 oz. blue vitriol, 1 oz. oil of vitriol and 1 gal. of water. Wash and dry in the usual manner.

METALLURGICAL DIGEST

A REVIEW OF METALLURGICAL MATTERS OF THE WORLD.
TRANSLATED AND EDITED BY HOWARD GREEN BAYLES, MET. E.

NEW ALLOYS.

Metallurgic publishes brief accounts of a couple of new alloys said to be in use in this country, but which seem to have so far escaped notice in these columns.

ALLEN'S METAL.

	Per cent.
Copper	55.25
Lead	44.61
Tin	0.14

This last can only be considered in the light of an impurity.

NICKEL ALUMINUM.

	Per cent.
Aluminum	74.40
Zinc	19.87
Copper	3.49
Manganese	1.42
Iron	.45
Silicon	.37

The last two elements are no doubt accidental impurities.

Both of these analyses were made of samples bought in the open market.

NEW MATERIAL FOR MOLD MAKING.

Der Metallarbeiter has a long illustrated article describing the applications of a new material for making molds. It has the great advantage of permitting undercuts and at the same time can be used to make metal castings. The composition of the new material, which is either called "Pergamon" or was invented by some one of that name, is not given. It can be poured in a liquid state into the flask around the pattern. After a certain time it acquires a rubbery or gelatinous elasticity, which permits the easy removal of the pattern. After a longer time and thorough drying it becomes very hard and is not affected by any fused metals. A pattern of either plaster or metal may be used.

DEAD BLACK FINISH.

Der Metallarbeiter describes a method for giving an unchanging dead black finish to copper. In the case of ornamental relief work, the high lights can be repolished before lacquering. First clean the casting in a pickle made of 1 part nitric acid, 1 part sulphuric acid and 1/100 part of common salt. When clean and bright, rinse thoroughly in clean water and treat for a few minutes in a 20 per cent solution of cyanide of potash warmed to about 100 degrees F. Wash again and treat until the desired color is obtained in the following solution:

10 qts. water.
½ lb. potassium sulphide (liver of sulphur).
3 oz. concentrated spirit of sal-ammoniac.

Finally rinse and dry.

ZINC FINISH.

Finely finished zinc articles may be treated as follows: Rub them first with quartz sand that has been moistened with hydrochloric acid. Then put them into a solution consisting of 48 parts distilled water, 4 parts caustic soda and 3 parts of copper oxide previously dissolved in acetic acid. This should be at a temperature about 50 degrees F. In 2 minutes this will give zinc a violet color, in 3 minutes a dark blue, and in 4½ minutes the color will be green. In order to stop this action at a desired point, it is necessary to rinse the article quickly. These colors should not be covered with lacquer, as it spoils them.

Mr. May, in the *English Mechanic*, suggests an alloy having as nearly as possible all the physical characteristics of copper except color. It consists of 85 per cent aluminum and 15 per cent zinc. It is said to be very ductile and tough.

SPONGE PLATING.

A month or two ago we gave a brief digest of M. R. Goldsmidt's process of electroplating, which uses, instead of a bath of electrolyte, only a sponge dipped in solution. This is connected with the positive pole of a 110 v. circuit, and lamps aggregating about 750 ohms resistance are connected in series, giving a plating current of only 1/7 ampere. We wish to supplement the above with the formulas of the solutions which have given the best practical results.

SILVER.

	Parts.
Silver nitrate	20
Potassium cyanide	30
Ammonia (96%)	4
Potassium formiate	2
Add water to make	1000

GOLD.

Gold chloride	6
Ammonia	2
Potassium cyanide	13
Add water to make	1000
Finally added potassium formiate	2

COPPER.

Copper sulphate	180
Concentrated sulphuric acid	60
Add water to make	1000
Finally add alcohol (96%)	10

NICKEL.

Nickel sulphate	60
Sodium sulphate	20
Sodium citrate	20
Add water to make	1000

A correspondent of the *English Mechanic* illustrates the acid character of celluloid by pointing out the fact that a lacquer made by dissolving celluloid in amyl acetate will preserve the most brightly polished brass indefinitely, while polished steel is discolored by it in a few hours. Steel articles may be kept bright when not in use by wrapping them in zinc foil.

Der Metallarbeiter outlines a method for producing a green color on zinc articles. First they must be electro-plated with brass. They are then moistened with weak vinegar and put until dry in an atmosphere of carbonic acid gas. This can be made by putting together marble or clam shells and dilute hydrochloric acid. Several repetitions of this treatment will produce a very handsome and durable patina.

A recent German patent describes a method of surfacing aluminum. A solution is used made by dissolving the chloride of the desired surface metal in water, and the aluminum is treated in this for some time. It is claimed that a part of the aluminum replaces the metal in solution, thus forming a metallic precipitate on the surface.

Professor Rinmann, of the University of Upsala, Sweden, is credited with having perfected a process for extracting aluminum from certain clays and bauxites at a cost 25 per cent less than current practice. No details are as yet at hand, but we shall look with interest for further particulars.

Coins may be tested for genuineness with a solution of 60 grains of silver nitrate in 1 oz. of water. This will quickly blacken base metals or alloys without affecting silver.

A paste which will adhere to a tinned surface is made by adding a little glycerine to a common starch paste.

Associations and Societies

REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

MEETING OF THE FOUNDRY SUPPLY ASSOCIATION.

Philadelphia, Friday, May 24, 1907.

The meeting was called to order by S. T. Johnston, president, who thanked the members for their hearty support during the past year.

President.

E. H. MUMFORD.

Secretary.

HENRY M. LANE.

Treasurer.

J. S. McCORMICK.

The secretary next read his report, showing the progress which had been made, and called attention to the fact that the membership now numbered 106. He also made a statement as to the finances of the association.

The treasurer next read his report, which corroborated that of the secretary. Each, however, called attention to the fact that it was impossible to render a final report until the affairs of the convention and exhibit had been wound up.

Next the nominating committee, T. E. Malone, H. Y. Seidel, E. J. Woodison, A. O. Backert, C. S. McNeal, reported as follows: "Your committee note the appointment of A. O. Backert to replace H. E. Pridmore, who was unable to serve, and respectfully submit the following nominations and recommendations:

"For president, E. H. Mumford, of the Mumford Manufacturing Company, Philadelphia, Pa.

"For first vice-president, W. P. Shepard, of Rogers, Brown & Co., Buffalo office.

"For second vice-president, W. S. Quigley, of the Rockwell Engineering Company, New York.

"Your committee recommend that the number of vice-presidents be increased from two to four, and for the additional two vice-presidents nominate:

"For third vice-president, H. R. Atwater, of Osborn Manufacturing Company, Cleveland, Ohio.

2nd Vice-President.

W. S. QUIGLEY.

4th Vice-President.

WILLIAM CHAMBERS.

"For fourth vice-president, William Chambers, of Garden City Sand Company, Chicago, Ill.

"For treasurer, J. S. McCormick, of the J. S. McCormick Company, Pittsburg, Pa.

"For secretary, H. M. Lane, Cleveland, Ohio.

"For trustees to succeed two retiring trustees:

"U. E. Kanavel, of the Interstate Sand Company, Cleveland, Ohio.

"E. J. Woodison, of the Detroit Foundry Supply Company, Detroit.

"Your committee further recommends an increase in the number of trustees from six to nine, and for the additional trustees nominate:

"For a three-year term, W. J. Thompson, of Hamilton Facing Mill Company, Hamilton, Ontario.

"For a two-year term, F. N. Perkins, of the Arcade Manufacturing Company, Freeport, Ill.

"For a one-year term, Geo. Rayner, of the Carborundum Company, Niagara Falls, N. Y."

As the report of the nominating committee recommended some changes in the constitution, these changes were first voted upon, after which the list of officers and trustees as nominated were unanimously elected.

ASSOCIATED FOUNDRY FOREMEN.

The fifth annual meeting was held during convention week at Philadelphia. In opening the meeting President Hugh McPhee dwelt at some length on the past and future of the progress of the foundry industry, after which the minutes of the previous meeting were read and approved. After the report of the auditing committee, which showed the records and accounts to be in a satisfactory condition, the nominating committee made their report and the following officers were elected: President, James B. Webb, Elkhart, Ind.; first vice-president, W. S. McQuillin, Warren, Pa.; second vice-president, W. O. Steele, Greenlock, N. J. The presidents of the local associations appoint the remaining vice-presidents. Secretary-treasurer, F. C. Everitt, Trenton, N. J.

A committee was appointed to revise the constitution.

The retiring president, Mr. McPhee, was elected to honorary membership.

A a special meeting held May 22 a plan for the circulation of papers at the meetings of the various local associations was discussed, voted upon and carried. The plan is to receive at the office of the secretary all papers read at the local meetings, the same to be compiled in pamphlet form and issued to all members of the association. Each local association will also receive copies which will serve to provide material for discussion at their meetings. Every effort is to be made to make the plan a success and it is hoped that the result will show material progress in this year's work.

EXHIBITS AT THE FOUNDRY CONVENTION, PHILADELPHIA.

The convention of foundrymen and foundry supply concerns held in Philadelphia last month, was noticeable for the large number of exhibits displayed in the Second Regiment Armory. The ample drill room of the armory was filled with exhibits from the most insignificant thing needed in the foundry to machines of great size. Nothing was lacking. And to make the exhibits more attractive, most of those that were intended to be run were in actual operation under working conditions. The educational value of the exhibition can therefore be appreciated. Those familiar with former conventions estimated that this one was larger than any previous one by at least 50 per cent. Below we make mention of exhibits; we only regret that lack of space forbids our entering into more details:

THE S. OBERMAYER COMPANY, of Cincinnati, Ohio, had a large central space which was comfortably fitted up with easy chairs and sofas. The space was adorned with photographs, but the many articles for the foundry manufactured by the company were not in evidence. Their customers and friends were made welcome, but the space was unique in the absence of foundry adjuncts; for that reason it attracted much attention.

THE DIAMOND CLAMP & FLASK COMPANY, of Richmond, Ind., showed their core making machines in operation.

THE FALLS RIVET & MACHINE COMPANY, of Cuyahoga Falls, had several of the Wadsworth core-making machines in operation. These machines turn out cores of any required section and any diameter.

HENRY E. PRIDMORE, 19th and Rockwell streets, Chicago, Ill., had an exhibit of several molding machines in operation.

THE MONARCH ENGINEERING & MANUFACTURING COMPANY, of Baltimore, Md., gave a practical exhibition of the Steele-Harvey crucible melting furnace for copper, bronze, brass, aluminum and the alloys. They also showed their fuel oil or gas and air burners, and had one of their burners in operation heating a Millett core oven.

THE COOPER HEWITT ELECTRIC COMPANY, of New York City, made a display of their vapor lamps in the tent adjoining the Armory.

THE HANNA ENGINEERING WORKS, of Chicago, Ill., had a large display of their electrically operated sand sifters. They also showed their portable riveters.

THE TABOR MANUFACTURING COMPANY, of 18th and Hamilton streets, Philadelphia, Pa., had several of their molding machines in operation.

THE BERKSHIRE MANUFACTURING COMPANY, of Cleveland, Ohio, presented many specimens of castings made with their molding machine. They also had in operation a molding machine complete, which proved how the sand was handled entirely by the machine from the sifting to the delivery to the flask.

THE J. S. MCCORMICK COMPANY, of Pittsburg, Pa., had one of their continuous sand mixing machines in operation. They had a new adjustable crucible tongs, one pair of which will grasp crucibles from No. 20 to 100; a larger pair will handle the larger sizes. Two pairs thus cover the entire range.

THE OSBORN MANUFACTURING COMPANY, of Cleveland, O., had a large exhibit of foundry supplies, brushes, brooms, bellows, buffs, etc. The various articles were placed upon the sides of two large pyramids.

THE ARCADE MANUFACTURING COMPANY, of Freeport, Ill., had their molding machines in operation. The display was well worth studying.

THE B. F. STURTEVANT COMPANY, of Boston, Mass., had a large exhibit of their blowers, fans and a model of their pressure blower. They had also a generating set or unit steam driven.

THE KILLING MOLDING MACHINE COMPANY, of Davenport, Iowa, presented a fine exhibit of their molding machines.

EDWARD J. ETTING, of Philadelphia, Pa., showed their cupola, tumbling barrels, ladles, etc., and the magnetic separator built by the Dings Electric-Magnetic Separator Company of Milwaukee, Wis.

R. B. SEIDELL, INC., 1322-34 Callowhill street, Philadelphia, Pa., had a large display of black lead crucibles. The exhibit had crucibles of all kinds and for all purposes.

EDWARD BROWN & SON, of Philadelphia, Pa., presented pyrometers for measuring temperatures for annealing furnaces, core ovens, cupolas, etc.

THE KERR TURBINE COMPANY, of Wellsville, N. Y., makers of steam turbines direct connected to generators, blowers, pumps, etc., had their machines in operation at the Philadelphia Bourse.

THE PRIMOUS CHEMICAL COMPANY, of Primous, Pa., displayed specimens of tungsten, molybdenum, etc.

THE CORTLAND CORUNDUM WHEEL COMPANY, of Cortland, N. Y., displayed their wheels in a large variety of shapes and sizes.

THE ROBESON PROCESS COMPANY, of Camden, N. J., had an extensive exhibit of their core sand binder, "Gluterin."

THE NEW ENGLAND ENGINEERING & EQUIPMENT COMPANY, of Boston, Mass., made a display of their electrically driven hoists.

THE FOUNDRY SPECIALTY COMPANY, of Cincinnati, Ohio, had a large exhibit of their "Partine" compound.

THE HERMAN PNEUMATIC MACHINE COMPANY, of Zelienople, Pa., builders of jarring molding machines, exhibited their machines in operation.

THE JOSEPH DIXON CRUCIBLE COMPANY, of Jersey City, N. J., made an exhibit of their line of crucibles. In addition they presented a fine array of crucibles that had been used. Of these four had been used in a Steele-Harvey furnace by one concern, and had lasted from 61 to 82 heats.

THE MONARCH EMERY & CORUNDUM WHEEL COMPANY, of Camden, N. J., displayed their emery wheels in all grades, and intended for all purposes.

THE NORTHERN ENGINEERING WORKS, of Detroit, Mich., showed their electric hoists and handling appliances.

THE MACPHAIL FLASK & MACHINE COMPANY, of Chicago, Ill., showed their steel flasks, which are practically indestructible.

J. W. PAXSON COMPANY, of Philadelphia, Pa. This company had a very complete exhibit and showed the manufacture of their foundry sieves and blowers. They also had a working exhibit of the manufacture of wire and bristle brushes. They also showed their furnaces, molding machines, mixers, and the extended line of foundry supplies made by them.

THE EXHIBITION BUILDING AND A FLEET OF PAXSON SAND WAGONS.

THE GOLDSCHMIDT THERMIT COMPANY, of 90 West street, New York City, gave a practical exhibit of the working of the thermit process.

THE THOMAS W. PANGBORN COMPANY, 90 West street, New York City, presented a display of the American diamond sand blast apparatus. They also had the Hammer core machine made by the Brown Specialty Machinery Company, for whom they are exclusive Eastern agents.

THE CHICAGO PNEUMATIC TOOL COMPANY, of Chicago, Ill., had an electrically driven air compressor in operation delivering air to a tank which supplied the pressure to all the exhibits requiring air. They also showed their pneumatic calking tools, chipping hammers, sand sifters, pneumatic foundry rammers.

THE WHITING FOUNDRY EQUIPMENT COMPANY, of Harvey, Ill., occupied a large booth, in which they displayed photographs of many of the plants they had built and equipped.

THE OLIVER MACHINERY COMPANY, of Grand Rapids, Mich., made a display of their lathes, saw tables, band saws, wood trimmers, and other tools of similar character.

THE J. D. SMITH FOUNDRY SUPPLY COMPANY, of Cleveland, Ohio, had their rolling core oven drawers; molds for babbitt and soft metals; melting furnaces; core oven trucks; tumblers. Their exhibit comprised some of the most useful devices to be found in the foundry.

STANLEY DOGGETT, 101 Beekman street, New York City, had an attractive exhibit of his Perfect Partings, the use of which means sharper castings, perfect corners, smoother surfaces, and easier lifts.

THE STANDARD SAND MACHINE COMPANY, of Cleveland, Ohio, had one of their machines in operation on raising sand by endless belt and buckets to dump it into the mixer, from which it passed to the screen, and thence to the trough fitted with screw conveyor.

THE U. S. GRAPHITE COMPANY, of Saginaw, Mich., displayed graphite in all stages of manufacture.

CYRUS BORGNER & Co., of Philadelphia, Pa., presented a large display of firebrick and fire clay.

THE CAMDEN COKE COMPANY, of Camden, N. J., exhibited samples of their coke.

EDWIN HARRINGTON SON & Co., of Philadelphia, Pa., had an exhibit of their differential hoists.

PETTINOS BROTHERS, of Bethlehem, Pa., had a very complete and attractive exhibit of graphite from Ceylon, Mexico, and Austria.

THE WILBRAHAM-GREEN BLOWER COMPANY, of Philadelphia, Pa., showed their pressure blowers in operation.

THE W. W. SLY MANUFACTURING COMPANY, of Cleveland, Ohio, had an unusually attractive exhibit of sand cleaners, and machinery especially designed for the foundry.

THE C. E. MILLS OIL COMPANY, of Syracuse, N. Y., displayed their liquid and dry core compounds.

THE CLEVELAND WIRE SPRING COMPANY had a wide line of steel pails, cans, etc., of all sizes.

C. DRUCKLIEB, 132 Reade street, New York City, had a large display of his sand blast machinery and appliances, including tanks, nozzles, etc., the apparatus being suitable for cleaning castings and other purposes.

THE JAMES L. TAYLOR MANUFACTURING COMPANY, of Bloomfield, N. J., had a large line of clamps in which the back rest is moved to any position on the bar and is held in place when pressure is brought to bear upon the work.

THE ROCKWELL ENGINEERING COMPANY, 26 Cortlandt street, New York City, had one of their double chamber metal melting furnaces for copper, brass, bronze, aluminum, iron and

steel, in full operation, so that the action of the furnace could be studied. This construction makes melting practically continuous, since while one chamber is actually melting, the other is heating the metal with the waste gases from the first.

THE HAWLEY DOWN DRAFT FURNACE COMPANY, 149 Broadway, New York City, has two Schwartz metal melting and refining furnaces, which are designed to use crude oil, fuel oil, or gas for fuel. These are intended for melting brass, copper, bronze, iron or steel, and the furnaces are made in capacities from 100 pounds to 10,000 pounds per heat.

THE KEYSTONE LUBRICATING COMPANY, of Philadelphia, Pa., had an attractive exhibit of their different grades of lubricants.

SMYTH, SWOBODA & CO., 73 Warren street, New York City, had a fine display of "Lycopart," a preparation that insures the true and perfect parting of the pattern from the sand. It is dusted lightly on the pattern—that is all.

W. W. LINDSAY & Co., Harrison Building, Philadelphia, Pa., showed their patented foundry chaplets and anchors. These chaplets are made of the best soft steel, which readily fuses with either cast iron or steel.

ARTHUR KOPPEL COMPANY, of New York City and Pittsburg, Pa., presented track, cars and turntables for industrial railroads.

THE MITCHELL-PARK MANUFACTURING COMPANY, St. Louis, Mo., had an interesting exhibit of their gravity molding machine.

THE LINK BELT COMPANY, of Philadelphia, Pa., had a typical exhibit of sand conveying machinery. The sand was lifted vertically, and then carried horizontally and dumped at any desired point covered by the machine.

THE WESTERN FOUNDRY SUPPLY COMPANY, of East St. Louis, Ill., had a display of their ferro-manganese, the use of which prevents blow holes and excessive shrinkage, and expels the sulphur. It also increases the strength.

THE A. BUCH'S SONS COMPANY, of Elizabethtown, Pa., had one of their automatic gravity molding machines set up and in operation.

THE RANDALL TRAMRAIL COMPANY, Philadelphia, Pa., had a working exhibit of the Moyer tramrail system for handling heavy materials in foundries, shops, etc.

THE DETROIT FOUNDRY SUPPLY COMPANY, of Detroit, Mich., had one of their Crandall cupolas on exhibition.

THE OTTO GAS ENGINE WORKS, of Philadelphia, Pa., had a large engine in operation in the tent, driving a generator which provided much of the current required by other exhibitors. They also had several other engines in operation.

PH. BONVILLAIN AND E. R. RONCERAY, of Paris, France, and 1315 Race street, Philadelphia, Pa., gave a practical exhibition of their universal system of machine molding; they had both large and small machines in operation.

THE HOLLAND LINSEED OIL COMPANY, of Chicago, Ill., displayed several cores which had been made with the use of their core oil.

THE YALE & TOWNE MANUFACTURING COMPANY, of New York City, had an interesting exhibit of their differential hoists, and electrically driven hoists. Several of these were placed upon a wooden frame and attached to weights, so that they could be tested in a practical way.

THE E. H. MUMFORD COMPANY, of Philadelphia, Pa., had a display of their molding machine and loose ring power sand shaker.

ITEMS OF INTEREST TO THE INDIVIDUAL.

J. O. Crane has sold his interest in the Michigan Copper and Brass Company, Detroit, Mich., and resigned as secretary and general manager. He is at present in the East. Mr. Crane has had twenty-one years' experience in the office, on the road and taking charge of the sales departments of brass mills.

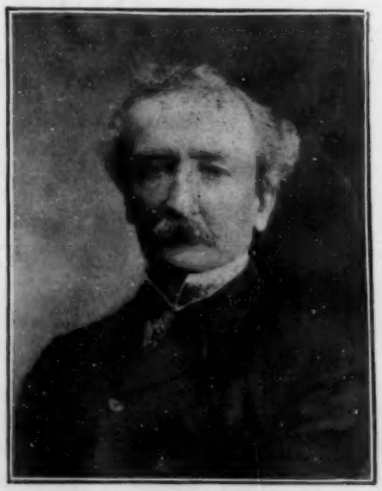
At the stockholders' meeting of the Michigan Copper & Brass Company, Detroit, Mich., held May 29, the following officers were elected for the ensuing year: President, Fred T. Moran; first vice-president and treasurer, James E. Danaher; second vice-president, D. M. Ireland; managing director, George H. Barbour; general accountant, W. F. Wiles; superintendent, Jeremiah Howe. The management report that the machinery of the new rolling mill is all in and that rapid progress is being made in putting it in position. They expect to have the mill in readiness for operation within sixty days.

DEATHS

Andrew B. Hendryx, head of the Andrew B. Hendryx Company, New Haven, Conn., manufacturers of bird cages, fishing reels and other metal devices, died at his home in that city May 9, in his 74th year.

JOHN A. WALKER.

John A. Walker, vice president and treasurer of the Joseph Dixon Crucible Company, died at his home, Jersey City, N. J., on May 23. Mr. Walker was born in the city of New York, September 22, 1837. He received his early education in the schools of Brooklyn, and although prepared for college in a private school chose commercial life. After an excellent business training in the city of New York, and after serving his country in the Civil War of the South, Mr. Walker in 1867 became connected with the firm of Joseph Dixon & Company, of Jersey City. In 1868, when the company became incorporated as the Joseph Dixon Crucible Company, he was made secretary and



JOHN A. WALKER.

began his lifework in making known to the world the many uses of the then but little known form of carbon—graphite, of which the Dixon Company have been the best and most widely known exponents. Mr. Walker served the company as secretary and

largely as manager until 1891, when he was unanimously elected to the dual position of vice president and treasurer, the latter office having been held by him for some time previous. He held these offices without interruption until his death, the general management of the company also being largely in his hands.

In stature Mr. Walker was somewhat below the average, but, born of sturdy Scotch parents, he was a good type of the nervous, driving, untiring, persistent Scotchman, and he possessed a large, finely-shaped head. In intellect he was keen, clear, critical, intuitive. In business he was thoughtful, cautious in looking ahead and preparing for emergencies. He had what is known as a wiry organization. His moral brain made him a just man. He was of the staunch Presbyterian school. What he believed to be right he did—no matter what others might do or say. Yet he was not contrary, nor set in his ways, nor unreasonable. While his sympathies were keen and easily aroused and his hand ready to open, yet no one found him wasting anything.

He was shrewd, energetic, liberal minded and greatly enjoyed a good joke and plenty of fun in its place. Nothing escaped his eye. He had decided literary tastes and could put them to the test any day, either for business purpose or for an ethical cause.

Untiring and persistent devotion to business, however, with increasing age and lack of needed rest and recreation, began to tell on his vigor and strength, and on April 24 he went home for what he and his intimates supposed would be a few days' rest. Complications set in and a month later he was at rest forever.

As vice president and treasurer of his own company there was more than work enough for any ordinary man, yet, outside of his duties as such we find him vice president Colonial Life Insurance Company, director New Jersey Title Guarantee and Trust Company, director Pavonia Trust Company, director the Provident Institution for Savings, president the Children's Friend Society, all of Jersey City, and trustee the Stationers' Board of Trade of New York. He was a member of the Chamber of Commerce of New York and of the Board of Trade of Jersey City. He was chairman of the Executive Committee of the Cosmos Club of Jersey City, member of the Carteret Club, the Union League Club, the Lincoln Association, all of Jersey City, member of the National Geographic Society, and associate member of the American Institute of Mining Engineers and of the Society for Psychical Research.

In the years gone by Mr. Walker had actively and successfully served as member of the Jersey City Board of Education, as trustee of the Jersey City Library and of other city institutions.

Mr. Walker leaves a widow only.

At a special meeting of the directors of the Joseph Dixon Crucible Company, held May 31, to take action on the death of Vice-President and Treasurer John A. Walker, Geo. T. Smith was elected vice-president, Geo. E. Long treasurer, and Harry Dailey was elected director and secretary.

PATENTS

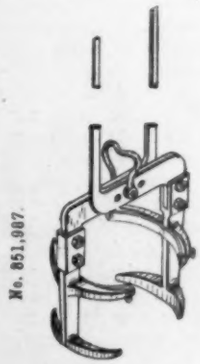
REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

852,922. May 7, 1907. JEWEL MOUNTING. Alfred A. Boismaure, of New York City, assignor to the Boismaure Oscillating Jewelry Company, of New Jersey. In this mounting there is a stationary attaching member and a vibratory member con-

No. 852,922.

nected therewith by a spring in such manner that the vibratory member with which, in practice, the jewel is connected is in a constant state of agitation. Although the invention is shown applied to a scarf pin, it is evident that it may be applied to any setting having an outer frame and an inner concentric member, these being connected by a spring.

851,987. April 30, 1907. CRUCIBLE TONGS. William H. Hewitt, of Cleveland, O. These tongs are intended for use in the re-

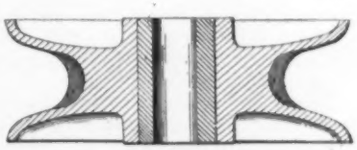


No. 851,987.

moval of crucibles or pots from furnaces. The tongs are adjustable so that a single pair may be used for crucibles of different sizes. In addition to this they are so made that they can be more readily and cheaply repaired than the tongs in common use. The drawing shows their construction.

852,903. May 7, 1907. CLEANING AND POLISHING COMPOUND. Henry B. Radford, Chicago, Ill., assignor to John A. Lyons, same place. This compound is used for cleaning and polishing iron, steel or other metals. It is perfectly non-explosive. It is composed as follows: 16 ounces neatsfoot oil, 4 ounces oxalic acid, 4 ounces powdered pumice stone, 4 ounces powdered tripoli, ½ ounce oil of gaultheria and sufficient water to make 1 gallon of the compound. It is stated that no film or scum will be left upon the article after the compound has been applied.

854,389. May 21, 1907. METHOD OF CASTING TROLLEY WHEELS. Francis Bowen Torrey, Portland, Me. This wheel is of the same general form as those in common use; it consists of a ring of hard metal placed at the bottom of the groove and embedded in



No. 854,389.

the body of the wheel. This forms the bearing surface which is exposed to the pressure and friction of the wire. The hard ring is of more expensive material than the body portion which in reality forms a support for it. In the mold this center ring is accurately supported in its true position so that it forms a true continuation of the groove.

851,435. April 23, 1907. TUBE ROLLING MILL. John C. Pry, Shelby, O. This invention relates to the manufacture of seamless drawn tubing and is adapted to be used in connection with a tube rolling mill. The object of the invention is to provide a means for supporting, guiding and bracing the mandrel rod when the tube or billet is being rolled over the mandrel or plug. A further object is to provide a device that will support and guide either long or short rods, making it practical to roll tubes of varying lengths and of different sizes and gauges, which considerably reduces the amount of labor that it is now necessary to perform without its use.

TRADE NEWS

TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

The Herron & Sharpe Brass Works, of Chattanooga, Tenn., has been granted a permit to put up a one-story shop.

The B. F. Lester Company, Fayetteville, N. Y., sells an aluminum solder and flux which they have just put on the market. Correspondence is solicited.

The Canada Corundum Company has moved its main office from Toronto to the works at Craigmont, Ont. Hereafter there will be no office in Toronto.

The E. Ingraham Company, clock manufacturers, of Bristol, Conn., have let the contract for their two-story brick building, 72x125, which will be used in their wood-working department.

The Connecticut papers report that the New Departure Manufacturing Company, of East Bristol, has decided to increase its plant by building a new brass foundry, 40x40. This, it is stated, will be followed by other buildings.

Milwaukee papers report that former employees of the Aluminum Foundry Company, at Manitowoc, Wis., have formed a corporation to be known as the Aluminum Manufacturing Company and will establish a plant at Fostoria, Ohio.

The Rockwell Engineering Company, 26 Cortlandt street, New York City, report that one of their double-chamber melting furnaces will be on exhibition at the Railroad Men and Master Mechanics' convention, to be held at Atlantic City, June 12-19.

Joseph Radnai, 36 Fulton street, New York, reports that he is able to sell platinum at $29 per ounce. He will pay 50 cents per hundred for old electric light bulbs, which rate Mr. Radnai says is a better return than for a firm attempting to get the metal out of old lamps.

The chemical and metallurgical business conducted by Carl A. Black, Bratenahl Building, Cleveland, Ohio, has been changed to Francis J. Peck & Co., Mr. Black still being a member of the firm. Their specialty is analyses and tests of metals and foundry products.

The Bureau of Supplies and Accounts, U. S. Navy Department, Washington, D. C., will open bids in Washington on June 18 for a great variety of material, including much that is produced by the metal industry. Further particulars can be had from the department.

The National Cash Register Company of Dayton, O., are preparing plans for an extensive new brass foundry. Their present foundry, erected six years ago, is far too small for the work now being done. The new undertaking will comprise buildings and complete equipment.

The local papers of Amesbury, Mass., announce that the Amesbury Brass and Foundry Company has a model plant and employs 26 hands. While the company has a local trade, its largest business is from out of town. Robert H. Hills is manager and Wm. E. Biddle, treasurer.

The American Nickeloit and Manufacturing Company, of Peru, Ill., announce that they are always glad to give any further particulars about their basket anode, the object of which is to use metal in its cheapest form and to have no waste. With them either grain nickel or scrap may be used.

Cutter, Wood & Stevens, Boston, Mass., the New York Sand and Facing Company, Brooklyn, N. Y., and Frank E. Sutch, Harrison Building, Philadelphia, Pa., have been appointed distributing agents for Stanley Doggett, 101 Beekman street, New York manufacturer of "Perfection" plating compound.

The Chas. J. Bogue Electric Company, 213 Centre street, New York, are turning out a large number of motor generators for plating purposes. In these units the generators are directly driven by the motors, the result being a self-contained set, in which one base carries the machines and all the controlling switches.

The Empire Brass Company, of London, Ont., Canada, announce that the City Council have agreed to give them the accommodations they require and they are now proceeding with the erection of their new building, letting the contracts for it. When their new plant is completed the company will employ 200 hands.

The Turner & Seymour Manufacturing Company, of Torrington, Conn., makers of brass and other metal goods, and gray iron castings, have about completed two additions to their plant —a finishing room 72x40 feet and a warehouse 64x40 feet. These additions were made necessary by the great increase in the business of the company.

One hundred pounds of antimonial lead for July delivery is the announcement of the Slipp-Butler Company, 45 Broadway, New York. The lead is said to contain 18 to 25 per cent. antimony and 1 to 3 per cent. tin. The company also sell bismuth metal, which they state is of superior quality and of which they have a stock for quick delivery.

The old brass foundry and finishing shop of Deck Brothers at 20 Indiana street, Buffalo, N. Y., has changed hands recently, the new owners being E. E. Perrers and James Maloney, two young men who have had experience in the business. The old firm name of Deck Brothers will be retained and the business carried on on the same site as formerly. The business was established nearly half a century ago.

The Hanson & Van Winkle Company, of Newark, N. J., are erecting an addition to their present works at Chestnut and Van Buren streets, Newark, N. J. The contract for the new building has been let, but the contract for the machinery is still open. The building will be devoted to the manufacture of low voltage dynamos for electro-deposition operations. The great increase in the business of the company has compelled this addition to their plant.

By the 1st of July the Turner Brass Works expect to be located in their new factory at Sycamore, Ill., where they have put up a building, 100x400, with attached power house and heating plant. The structure is a one-story building, with light on all sides and a saw-tooth roof, that there may be a perfect light all around. They have added considerable new machinery to their equipment and will be in better shape than ever to supply the demands of the trade and to promptly fill orders.

Charles M. Dally, 29 Broadway, New York representative of the Bates & Peard Patent Annealing Furnace Company, of Liverpool, Eng., has just contracted with the Waclark Wire Company for two very large banks of furnaces to be erected at their plant at Elizabeth, N. J., in a building to be especially built for their reception. These furnaces are to be run night and day on the same principle as those now in operation in Germany, and will be the largest set of annealing furnaces of this type that have ever been erected in this country. They are expected to be running in four months.

Charles H. Birmingham, 231 S. Exeter street, Baltimore, Md., is putting on the market an alloy, which he calls "Pro-Platinum,"

that is useful for electrical connections and costs but one-third as much as pure platinum. In his patent specification, No. 824,618, Mr. Birmingham states that the alloy is composed of silver, nickel, bismuth and gold. The alloy has been patented in Great Britain and in some of the British colonies. Besides the "Pro-Platinum," Mr. Birmingham makes pure nickel and copper castings in green sand. One of his orders was a set of harness hardware of pure nickel.

FIRES

A fire visited the two upper floors of the 27th street building of the Manhattan Brass Company, of New York, on May 25, but the management state that the daily newspaper reports about the damage were greatly exaggerated. There was no explosion of any kind. Repairs were under way immediately.

REMOVAL NOTICES

The Iroquois Machine Company, 150 Nassau street, New York, have moved to 60 Wall street.

G. B. & J. F. Withers, platers, of 411 Broadway, Albany, N. Y., have moved to 63 Rensselaer street.

The Elizabethport Brass Foundry Company, 137 Elizabeth avenue, Elizabeth, N. J., have moved to 50 South street, New York City.

Colton & Co., manufacturers of metal novelties, 227 Locust street, Philadelphia, Pa., have moved to Hamilton street, Station S.

R. Plumacher & Sons, manufacturers of metal novelties, formerly 341 E. 59th street, New York, are now located at 514 W. 57th street.

The Salo Art Metal Company, formerly located at 462 E. 136th street, New York City, have moved to 19 Collier street, Binghamton, N. Y.

The Kismet Specialty Company, manufacturers of metal novelties, formerly located in the Park Row Building, New York, have moved to 2 W. 16th street.

The U. S. Chemical Company, manufacturers of platers' and polishers' supplies, formerly located at 10 Wade Building, Cleveland, Ohio, have removed to 3621 Lakeside avenue.

FINANCIAL

The report of the Anaconda Copper Company, for the year ended September 31 last shows an increase of $3,234,667 in total receipts, which amounted to $26,968,870. The total disbursments were $18,384,701, leaving the net income at $8,584,169. These net profits which are 29.47 per cent on the company's $30,000,000 of stock, remain after the deduction of all expenses of development, depreciation, and depletion of coal and timber lands. Dividends totalling $6,900,000 were paid, being double the disbursements in the previous year.

The fifth annual report of the International Nickel Company has been issued. The total earnings for the year ending March 31 last were $2,853,649. Deducting administrative and head office expenses, the net income was $2,689,463. Taking from this the provision for depreciation of plants, $159,054; mineral exhaustion $89,484; bond sinking fund, $161,250 and interest on bonded debt, $490,175, leaves the profits for the year at $1,789,499. The common stock outstanding amounts to $8,822,661, and the preferred stock $8,912,626. The preferred stock dividends amounted to $534,730.

It has been announced that the Silversmiths Company, organied some time ago by the merger of the Silversmiths Company and the Silverware Stocks Company, has secured the assent of more than enough stockholders of the Gorham Manufacturing Company to insure the merger with that company also. The total authorized capital stock of the merger company is $14,000,000, of which $2,000,000 has been issued in exchange for securities of the Silverware Stocks Company and $6,000,000 will be offered in exchange for the stock of the Gorham Company.

The directors of the National Lead Company have declared a quartely dividend of 1½ per cent of the common stock. This is an increase of one-quarter of 1 per cent over the previous payment, which was made on April 1 last, and places the issue on a 5 per cent per annum basis. The company resumed dividends on this issue in July, 1906, at the rate of 1 per cent quarterly, and that rate was maintained until April of the present year. The directors also declared a regular quarterly rate of 1¾ per cent on the preferred stock. The common dividend is payable July 1 and the preferred June 15.

INCORPORATIONS

The Commercial Bronze Company, of New York City, has been incorporated with a capital of $25,000 by John A. Daly, 103 East 19th street, Caroline F. Marsh, 17 Livingston place, and Lewis R. Schultz, 9 East 22nd street, all New York. The company will manufacture metal goods.

The Bordan Brass & Bronze Company, of Borough of Queens, New York, has been chartered by the State Department with a capital of $2,000. The directors are as follows: H. A. Keller of New York City, Henry Wenz of Astoria, N. Y., and W. V. Wilson of Flushing, N. Y.

L. H. Gilmer & Co., of 504 Arch street, Philadelphia, Pa., have incorporated their business under the name of the L. H. Gilmer Company, with a capital stock of $100,000. Ludwell H. Gilmer, president; G. W. Gilmer, Jr., vice-president. The new company will have greatly increased facilities for manufacturing the Gilmer belting and endless belts, and will continue at the same address to carry on the jobbing end of the business in machinery and supplies formerly conducted by L. H. Gilmer & Co.

PRINTED MATTER

Brushes.—The American Wire Brush Company, 25 Broad street, New York, have issued a leaflet descriptive of their hand and wheel brass and steel brushes. Their line includes a large variety of different sizes and shapes.

Turner Little Wonder Lamp. A circular has been received from the Turner Brass Works, Chicago, Ill., describing their No. 20 little wonder lamp, which is adapted for stores, halls, shops, etc. It is finished in triple nickel plate and is equipped with an automatic cleaning needle. All parts are interchangable.

Hydraulic Jacks. Circulars have been received from the Watson-Stillman Company, 26 Cortlandt street, New York City, describing their claw and broad base hydraulic jacks. The first is used when there is not room enough to get the head under the work, and the latter stands upon the ground and is placed under the work.

Tumbling Barrels.—A large folder has been received from the Globe Machine & Stamping Company, of Cleveland, O., describing their tilting oblique tumbling barrels, which are money makers wherever they are used for cleaning small articles, such as metal stampings, drop forgings, or metal castings. They are stated to save time, space, labor and money.

A Solder for Aluminum that Works is the titleof a small pamphlet issued by the E. F. Lester Company, of Fayetteville, N. Y., describing their aluminum solder and flux. This solder is also applicable to the soldering of aluminum to brass, copper and iron. It is essentially a soft solder and the work is done with an ordinary soldering iron. After the work has been tinned with the aluminum solder and flux, ordinary half and half solder can be used to complete the job, or the work can be finished with the aluminum solder.

BRUSHES AND BROOMS—FOUNDRY SUPPLIES.—A large and comprehensive catalogue covering their wide line of foundry supplies and hardware specialties has been issued by the Osborn Manufacturing Company, of Cleveland, O. The company have added many new lines of foundry tools and supplies which are fully illustrated and described in the book. In addition to their complete range of brushes for other trades they make all the brushes of every kind used in the foundry. Their circular scratch and finish brushes are intended particularly for electroplaters, brass finishers and all kinds of metal polishers.

FOUNDRY FURNISHINGS is the title of a large book of over 400 pages issued by the Detroit Foundry Supply Company, of Detroit, Mich. In looking over this large catalogue it seems hardly creditable that this concern is only a little over two years old. That a business of such magnitude could be built up in so short a time speaks volumes for the push and ability of those having control of its management. The firm do not make everything mentioned in the catalogue, but they do make facings and some of the most important foundry equipment. They carry a duplicate stock at Windsor for the benefit of their Canadian customers.

POLISHING AND GRINDING MACHINERY. A large and handsome catalogue by the Dow Chemical Manufacturing Company of Mansfield, O., and Bridgeport, Conn., deals with their electroplaters' and polishers' equipment and supplies. This catalogue describes their polishing lathes and heads, combined grinders and buffers, grinding machines, countershafts, etc. The spindles used in their polishing and buffing lathes are made of the best machinery steel, turned and ground to size. The ends are provided with threads of 29° angle of the same depth as, but stronger, than the square thread generally used. The flanges are heavy and of large diameter.

AUTOMATIC POLISHING MACHINERY.—The J. A. Parker Company, with sales office at 603 Livingston Building, Rochester, N. Y., factory, 20 Indiana street, Buffalo, N. Y., have issued Bulletin No. 1 descriptive of their automatic polishing and buffing machines. The bulletin contains a description of the economy, dependability and health conditions which come with automatic polishing and an outline of the important features of construction of machinery. It is also illustrated with the various types of Parker machines. The company, which was recently organized, is composed of Ernest E. Perrers, mechanical engineer, Chas. H. Dunavan, a polishing expert, and Jonas A. Parker, who has been interested in the machine polishing business for some time. The company state they have already machines at work on hollow-ware and are building polishers for other classes of work.

CATALOGUE BUREAU

THE METAL INDUSTRY has established a Catalogue Bureau by which it will prepare and do all the work necessary for the making of catalogues, pamphlets, circulars and other printed matter. Estimates will be furnished for writing the description, making engravings, printing, binding, in fact for the entire job from the beginning to the end or any part of it. Let us know your needs and we will tell you just exactly what we can do and what it will cost you. A catalogue should be a trade getter—that is the kind we produce. Write to the CATALOGUE BUREAU of THE METAL INDUSTRY, 61 Beekman street, New York.

METAL MARKET REVIEW

NEW YORK, June 7, 1907.

COPPER.—Standard copper in London opened at £106 15s., declined later to £98 5s., and closed at £101 5s. The stocks of Standard have been very much reduced during the last few weeks owing to the purchases made in the London market and shipped to America to be refined.

The domestic copper market is in a more or less unsettled condition. The leading selling agents are standing pat at 25½ for Lake and 25¼ for Electrolytic; they are not selling a pound of copper at these prices, so that as far as the market or the price is concerned they might just as well be asking 30c. for Lake and 29¾ for Electrolytic. At present they are not factors in the market in any way, and furthermore they claim to be sold up to the end of June and no consumers are placing any contracts for futures. As the market stands to-day we find there are several lots of copper on the market and there are no buyers. Consumers are not making bids and are only buying for immediate needs, so that lower prices are ruling to-day than a month ago. There may not be very much of this copper, but against that there are no buyers and this copper constitutes the market at the present time. Conditions are not the same as six months back; then we were at the top of a tremendous expansion in business and everything was rosy; to-day the indications are that pig iron has reached top, the railroads, the largest consumers of metals in the country, are forced to retrench and cut down improvements, and all metal markets are going to feel the effects. Consumers of copper are no exception and they will probably go slow and hold off as long as possible. We call the market to-day entirely nominal: Lake, 24 to 25 cents; Electrolytic, 23½ to 24 cents, and casting at 22 to 22½ cents. The exports for the month were very small, 8,373 tons, while the imports were over 11,000 tons.

TIN.—In London tin has acted as erratically as usual. Spot tin opened at £195 10s., declined to £189 10s., and closed at £190. The trading has been active, but purely speculative.

The New York market is entirely controlled by London houses now and as London goes up or down we follow. There has been a scarcity of spot tin, helped along by the longshoremen's strike, and prices have fluctuated here rather actively. Spot tin sold up to 44.10, while deliveries a few weeks off were selling at 2 cents lower. The figures for the month were more or less bearish, and consumption for the month was very much reduced. The Metal Exchange makes the consumption for May 2,500 tons against 3,650 in April. We quote the market to-day: 5 to 10 ton lots, spot 41.00 cents; June delivery, 40.75 cents.

LEAD.—The London market has ruled fairly steady at from £20 5s. at the opening down to £19 12s. 6d. and closed at £20.

The New York market has suffered from dull trade and prices sagged off to below the trust figure of 6 cents, New York, so that on the 3d of April the trust reduced prices 25 cents per pound, making New York shipment 50-ton lots 5.75. The market closes dull and easier.

SPELTER.—The London spelter market has declined nearly £2 during the month, but is still above our market. London opened at £26 and closed at £24 15s., the lowest.

The New York market has declined about ¼ cent during the month and closes rather steadier, with prices about 2½ points above the lowest. St. Louis to-day, 6.37½. New York delivery, 6.55. Futures are 5 to 10 points lower.

ANTIMONY.—London prices show a further rapid decline and we are to-day £42 per ton lower than on January 1st, and the market here is weak and unsettled at around 15½ for Halletts against 22 cents in Janaury. Prices for antimony are getting down to a more normal basis.

ALUMINUM.—No change in conditions. Production is still way behind and the enlargement of the plant is progressing very slowly. We are quoted the market entirely nominal at from 48 to 50 cents according to quantity and time of delivery.

SILVER.—The market has ruled fairly steady, with slight fluctuation, opening at 31d. in London, 67¼ cents in New York, and closing at close to the same figures.

SHEET METALS.—There has been no change in the base price of sheet copper or brass. Trade is reported good and the mills are busy.

OLD METALS.—The market has been dull and more or less unsatisfactory. Consumers have held off and dealers complain at having to cut prices on all sales. There is no snap to the market and prices are decidedly lower. Zinc dross holds steady at around 5⅛ cents, New York.

See Advertising Page 25 following for Trade Wants

Metal Prices, June 10, 1907

METALS.	Price per lb.
COPPER, PIG, BAR AND INGOT AND OLD COPPER. Duty Free. Manufactured 2½c. per lb.	
Lake, car load lots	25.00
Electrolytic, car load lots	24.00
Casting, car load lots	22.00
TIN—Duty Free.	
Straits of Malacca, car load lots	41.00
LEAD—Duty Pigs, Bars and Old 2⅛c. per lb.; pipe and sheets 2½c. per lb.	
Pig lead, car load lots	5.85
SPELTER—Duty 1½c. per lb.	
Western, car load lots	6.60
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods 13c. per lb.	
Small lots .....Nominal	50.00
100 lb. lots "	49.00
Ton lots "	48.00
ANTIMONY—Duty ¾c. per lb.	
Cookson's, cask lots, nominal	18.50
Halletts, cask lots	15.50
Other, cask lots	15.30
NICKEL—Duty 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.45 to .60
MANGANESE—Duty 20%	.80
MAGNESIUM—Duty Free	$1.50
BISMUTH—Duty Free	1.50 to 1.55
CADMIUM—Duty Free	1.55 to 1.60
	Price per oz.
GOLD—Duty Free	$20.67
SILVER—Duty Free	.66⅝
PLATINUM—Duty Free	30.00
QUICKSILVER—Duty 7c. per lb. Price per flask	41.00

OLD METALS.	Price per lb.	
Heavy Cut Copper	$19.00	$21.00
Copper Wire	19.00	19.50
Light Copper	17.00	18.00
Heavy Mach. Comp	17.00	18.00
Heavy Brass	13.00	14.00
Light Brass	11.00	11.50
No. 1 Yellow Brass Turnings	12.00	13.00
No. 1 Comp. Turnings	15.00	15.50
Heavy Lead	4.75	5.00
Zinc Scrap	4.50	5.00
Scrap Aluminum, sheet, pure	30.00	32.00
Scrap Aluminum, cast, alloyed	25.00	30.00
Scrap Aluminum, turnings	10.00	13.00
Old Nickel, solid	18.00	25.00
No. 1 Pewter	30.00	31.00

	Price per lb.
SILICON COPPER, according to quantity	.37 to .39
PHOSPHOR COPPER, 5%	.25 to .27
Phosphor Tin	.47 to .48
Brass Ingot, Yellow	.15 to .17
Brass Ingot, Red	.18 to .21
Bronze Ingot	.17 to .20
Manganese Bronze	.20 to .22
Phosphor Bronze	.22 to .25

ZINC—Duty, sheet, 2c. per lb.	Price per lb.
600 lb. casks	9.10
Open casks	9.60

PHOSPHORUS—Duty 18c. per lb.	
According to quantity	.35 to .50

PRICES OF SHEET COPPER.

SIZES OF SHEETS.		96oz. & over 75 lb. sheet 30x60 and heavier	64oz. to 96oz. 50 to 75 lb. sheet 30x60	32oz. to 64oz. 25 to 50 lb. sheet 30x60	24oz. to 32oz. 18¾ to 25 lb. sheet 30x60	16oz. to 24oz. 12½ to 18¾ lb. sheet 30x60	14oz. and 15oz. 11 to 12½ lb. sheet 30x60
		CENTS PER POUND.					
Not wider than 30 ins.	Not longer than 72 ins.	32	32	32	32	32	33
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	32	32	33
	Longer than 96 ins.	32	32	32	32	32	34
Wider than 30 ins. but not wider than 36 ins.	Not longer than 72 ins.	32	32	32	32	32	34
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	32	32	34
	Longer than 96 ins. Not longer than 120 ins.	32	32	32	32	33	35
	Longer than 120 ins.	32	32	32	33	34	
Wider than 36 ins. but not wider than 48 ins.	Not longer than 72 ins.	32	32	32	33	34	36
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	33	35	37
	Longer than 96 ins. Not longer than 120 ins.	32	32	32	34	36	40
	Longer than 120 ins.	32	32	33	35	38	
Wider than 48 ins. but not wider than 60 ins.	Not longer than 72 ins.	32	32	32	33	35	38
	Longer than 72 ins. Not longer than 96 ins.	32	32	32	34	36	41
	Longer than 96 ins. Not longer than 120 ins.	32	32	33	35	38	
	Longer than 120 ins.	33	33	34	36	40	
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 ins.	32	32	33	35	40	
	Longer than 96 ins. Not longer than 120 ins.	32	32	34	37	42	
	Longer than 120 ins.	33	33	35	40		
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 ins.	33	33	35	38		
	Longer than 96 ins. Not longer than 120 ins.	34	34	36	39		
	Longer than 120 ins.	35	35	37	41		
Wider than 108 ins.	Not longer than 132 ins.	36	36	38			
	Longer than 132 ins.	37	37	40			

Rolled Round Copper, ⅜ inch diameter or over, 32 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 3½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Metal Prices, June 10, 1907

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot, and heavier, per lb.	36c.
12 oz. and up to 14 oz. to square foot, per lb.	37c.
10 oz. and up to 12 oz.	39c.
Lighter than 10 oz.	42c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICES ON BRASS MATERIAL.

In Effect January 21, 1907, and Until Further Notice.

To customers who purchase less than 5,000 pounds per month and over 5,000 pounds per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.22¾	$0.26	$0.28¼
Wire ¼" and larger	.23	.26¼	.28½
Wire smaller than ¼" to No. 8, inclusive	.23¾	.27	.29¼
Wire smaller than No. 8 to No. 10, inclusive	.24¼	.27½	.29¾
Rods smaller than ⅛" diameter	.23¼	.26½	.29¾
Rods ⅛" to 1" diameter, inclusive	.23	.26¼	.29½
Brazed brass tubing	.29⅞	—	—
Brazed Bronze and Copper Tubing	—	—	.33¼
Open Seam Brass Tubing	.27⅞	—	—
Open Seam Bronze Tubing	—	—	.31¼
Brass Moulding	.29⅞	—	—
Bronze Moulding	—	—	.33¾

15% discount from all extras.

To customers who purchase less than 5,000 pounds per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.23¾	$0.27	$0.29¼
Wire ¼" and larger	.24	.27¼	.29½
Wire smaller than ¼" to No. 8, inclusive	.24¾	.28	.30¼
Wire smaller than No. 8 to No. 10, inclusive	.25¼	.28½	.30¾
Rods smaller than ⅛" diameter	.24¼	.27½	.30¾
Rods ⅛" to 1" diameter, inclusive	.24	.27¼	.30½
Brazed brass tubing	.30⅞	—	—
Brazed bronze and copper tubing	—	—	.34¼
Open seam brass tubing	.28⅛	—	—
Open seam bronze tubing	—	—	.32¼
Brass moulding	.30⅞	—	—
Bronze moulding	—	—	.34¾

5% discount from all extras.

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 8½ in. O. D. Nos. 4 to 13 Stubs Gauge, 27c. per lb.
Seamless Copper Tubing, 32c. per. lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	35	34	29	28	27	27	27	27	27	27	27	28	29	31	33	34

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 Feet. Brass.	Bronze.
⅝ inch	$8.00	$9.00
¾ inch	8.00	9.00
⅞ inch	10.00	11.00
1 inch	12.00	13.00
1⅛ inch	14.00	15.00
1¼ inch	18.00	20.00
1½ inch	22.00	24.00
1¾ inch	25.00	27.00
1⅞ inch	32.00	35.00
2 inch	45.00	48.00
	56.00	60.00

Discount 30 per cent.

GERMAN SILVER TUBING.

4 per cent. to No. 19, B. & S. Gauge, inclusive	$0.60
6 " " 19, " " "	.70
9 " " 19, " " "	.85
12 " " 19, " " "	1.00
15 " " 19, " " "	1.15
16 " " 19, " " "	1.20
18 " " 19, " " "	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.

For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 10 per cent.

Prices on Sheet Block Tin and Britannia Metal.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quantity.

Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than and .. including ..	*8in. 12in. in coils.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.	Cutting to Length.	Polishing or Satin Finishing one Side.
No. 13 and heavier..	47	47	49	49	49	49	52	52	52	1	2
" 14	47	47	49	49	49	49	52	52	52	1	2
" 15	47	47	49	49	49	49	52	52	52	1	2
" 16	47	47	49	49	49	49	52	52	52	1	2
" 17	47	47	49	49	49	49	52	52	52	1	3
" 18	47	47	49	49	49	49	52	52	55	1	3
" 19	47	47	49	49	49	49	52	53	56	1	4
" 20	47	49	49	49	49	51	54	55	57	1	4
" 21	47	51	51	51	51	53	56	57	63	2	5
" 22	47	51	51	51	53	53	56	60	64	2	5
" 23	47	51	51	51	53	53	56	62	65	2	6
" 24	47	51	53	55	55	55	58	64	67	2	6
" 25	49	52	54	56	56	56	59	66	70	2	7
" 26	49	52	55	59	59	59	64	68	74	2	8
" 27	49	53	57	61	61	62	67	71	77	2	10
" 28	49	53	59	61	62	62	69	75	80	2	11
" 29	51	54	61	63	65	65	74	80	85	2	13
" 30	51	55	63	65	69	75	82	85	90	2	15
" 31	56	60	68	71	76	84	87	90	96	3	17
" 32	58	62	70	74	82	90	97	103	108	3	19
" 33	60	64	73	78	86	97	104	113	123	3	21
" 34	63	68	75	83	91	104	116	123	133	3	25
" 35	..	78	83	93	103	113	128	138	..	..	..
" 36	..	93	103	113	128	133	148	..	..	..	..
" 37	..	117	121	142	157	172	187	..	..	..	..
" 38	..	137	152	167	182	197	217	..	..	..	..
" 39	..	157	177	197	217	237	..	..	..	..	..
" 40	..	187	217	237	257	..	..	..	..	..	..

*Polished or scratch brushed 2 sides, double above prices.

Advance is asked over list prices owing to scarcity of material.

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICES LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

Stubs' G.	⅛"	¼"	⅜"	½"	⅝"	¾"	1"	1½"	2"	2½"	3"
4 to 11	..	..	96	86	83	77	67	61	61	61	
12	..	1.08	96	86	83	77	67	61	61	61	
13	..	1.08	96	86	83	77	67	64	64	64	
14	..	1.08	96	86	83	77	67	64	64	64	
15	..	1.12	96	89	86	80	70	67	67	67	
16	..	1.15	99	93	89	83	70	70	70	70	
17	..	1.18	1.02	96	93	86	73	73	73	73	
18	1.85	1.24	1.05	99	93	86	77	77	77	80	
19	1.88	1.28	1.08	1.02	99	93	83	80	80	83	
20	1.95	1.31	1.15	1.08	1.05	99	89	86	86	89	
21	2.01	1.37	1.21	1.15	1.12	1.05	99	93	93	96	
22	2.17	1.44	1.24	1.18	1.15	1.08	1.05	99	1.05	1.05	
23	2.33	1.50	1.31	1.24	1.21	1.15	1.15	1.08	1.15	1.15	
24	2.48	1.60	1.37	1.31	1.28	1.18	1.21	1.21	1.24	..	
25	2.65	1.69	1.47	1.37	1.34	1.28	1.34	..	..	..	

Prices are for lots of 50 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B. & S. G'ge	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb.	43	43½	43½	44	44½	45	45½	46	47	48	49	52	57

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 30 per cent.

Munts or Yellow Metal Sheathing (14" x 48")	22c. lb. net base.
" " " Rectangular Sheets other than Sheathing	24c. " " "
" " " Rod	23c. " " "
Tobin Bronze Rod	25c. " " "

Above are for 100 lbs. or more in one order.

PRICE OF SHEET SILVER—Rolled sterling silver .925 fine. For gauges below 32 B. & S., 2 cents below price of bullion. Above 32 B. & S. gauge from 2 to 4 cents above the price of bullion. Rolled silver anodes .999 fine, 2 cents above the price of bullion. These prices are according to quantity and market conditions.

TAYLOR CRUCIBLES

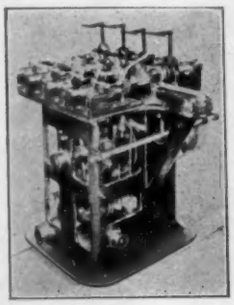
For Years the Recognized Standard for Uniform Service

IF INTERESTED WRITE US

ROBERT J. TAYLOR, INCORPORATED

1900 to 1916 Callowhill Street *PHILADELPHIA, PA.*

A MACHINE THAT SAVES TIME AND LABOR



FOUR SPINDLE AUTOMATIC COCK GRINDER

SEND FOR FURTHER PARTICULARS

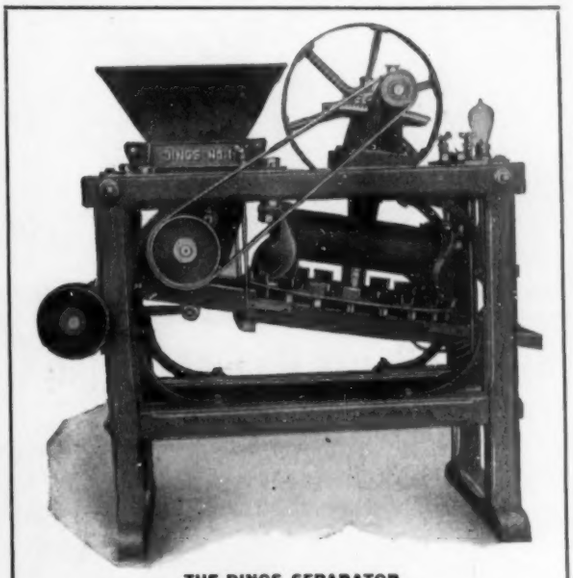
Turner Machine Co.

Manufacturers of

MOULDING MACHINES, AUTOMATIC COCK GRINDERS and KEY LATHES METAL PATTERN MAKING

2049 NORTH SECOND STREET
PHILADELPHIA, PA.

MAGNETIC SEPARATORS



THE DINGS SEPARATOR

DIFFERENT KINDS AND SIZES MADE TO SUIT ANY REQUIREMENTS

DINGS ELECTRO-MAGNETIC SEPARATOR CO. MILWAUKEE, WIS.

Annealing Without Oxidation by Automatic Machines

BATES & PEARD ANNEALING FURNACE CO.
C. M. DALLY, Agent, 29 Broadway, N. Y.

NO PICKLING — Large Saving in Labor and Fuel
NO SCALE — Illustrated Catalogue Sent on Application.

Magnetic Separators

for removing Iron from Brass, Bronze, Babbit metal chips, Emery dust, etc. A postal will bring reduced price-list. Sold by J. W. Paxson Co., Philadelphia, Pa.

CHAS. T. BURLIN
Whitinsville, Mass.

MACKELLAR'S PREPARED CHARCOAL

FOR BRASS FOUNDERS

Has a wide reputation for superiority. Write for samples, prices and full information.

THE PEEKSKILL FACING MILLS — Established 1844. Incorporated 1902. — Address R. MacKELLAR'S SONS CO. Peekskill, N. Y.

Registered Trade Mark.

WAX WIRE

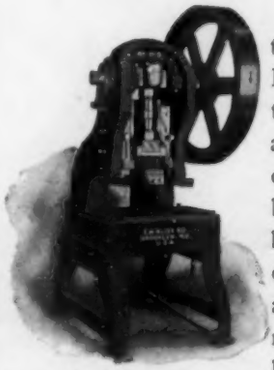
of the LION BRAND supplied by us is superior to all others, and invaluable for delicate and intricate core work. It leaves the vent hole free and unobstructed. Sizes from 1 m.m. to 12 m.m. The former costs about 5c. for 100 lineal feet. The larger sizes proportionately inexpensive. Perfectly flexible under all temperatures. In coils of one pound each continuous lengths.

Samples sufficient for practical test, free of charge on application

ALFRED FIELD & CO., 93 CHAMBERS STREET NEW YORK CITY

For Index to Advertisements See Page 32.

"BLISS"



The accompanying illustration shows our No 31-S Press, this press is adapted to a wide range of work among manufacturers of enameled iron and tin ware, being suitable for both blanking and combination dies, it is fitted with removable front piece, which makes it also available for horning and wiring, in fact, a press that cannot be beaten for general work.

Presses for Every Purpose.

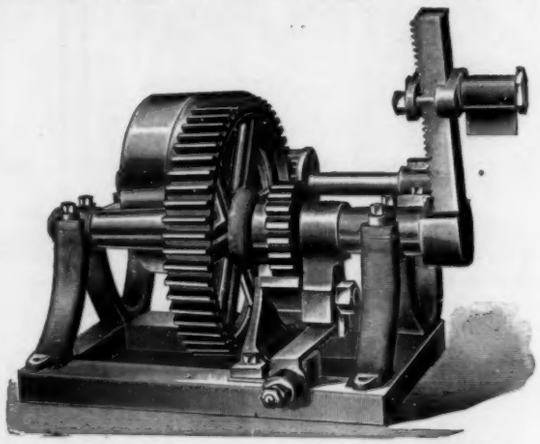
E. W. BLISS CO.

23 ADAMS STREET, BROOKLYN, N. Y.

Agents for Chicago and vicinity—Stiles-Morse Co., 138 Jackson Boulevard, Chicago, Ill. EUROPEAN OFFICE—100 Boulevard Victor Hugo, St. Ouen (Paris), France.

The PECK

Automatic Drop Lifter



Can be readily applied to any drop, and while it increases your output, decreases your pay roll.

We manufacture DROP PRESSES for all purposes and are Specialists in that line.

THE PECK DROP PRESS WORKS

MINER & PECK MFG. CO., Proprietors

425 Chapel St. NEW HAVEN, CONN.

The TORRINGTON MANUFACTURING CO.

TORRINGTON, CONN.

Finishing Machinery for Brass and Copper Mills to Order

Acid Cleaning, Steam and Sawdust Drying-out Machines.
Power Presses, Single and Double Action Cam or Crank.
Flattening, Straightening and Overhauling Machinery.
Multiple Plunger, Cut and Carry Presses.
Slitters, Scrap Cutters and Coilers, in a variety of Styles and Sizes.
Channel Iron Mill Trucks to suit any Requirements.
Metal Saws and Power Shears.
Drawbenches.

SPECIAL MACHINERY AND TOOLS OF ANY DESCRIPTION

ROLLS

FOR

Steel, Iron, Brass, Copper and Rubber Works

PHILADELPHIA ROLL & MACHINE COMPANY

23d Street and Washington Avenue, Philadelphia, Pa.

New England Representatives:
HARRINGTON, ROBINSON & CO.
272 Franklin Street
Boston, Mass.

Cable Address:
"PHILROLLCO., PHILADELPHIA"
Long Distance and Local Phone
LOCUST 825

HYDRAULIC JACKS

¶ The different styles and sizes of Watson-Stillman Jacks number 400. No matter what your particular job may be, we have the hydraulic jacks to handle it with the greatest convenience, despatch and economy.

¶ No matter whether the load is lighter or heavy, we have the tool. Every Watson-Stillman tool is guaranteed.

¶ Send for Jack Catalogue and you will see a sure way out of your Jack troubles.

Watson-Stillman Co., Main Office: 26 Cortlandt Street, New York City
Branch Office: 453 Rookery, - Chicago, Ill.

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Here's the Tumbler that "Proves Up"

Want to be "SHOWN"? Then send for our Tumbler Book. It's free.
Other tumblers require two operations to dump the contents into a small receptacle—Globe only ONE.

Globe Tumblers

admit of a perfect adjustment in the degree of action on the barrel's contents—this is regulated by the hand wheel. Sheet metal stampings and small castings are tumbled without injury. Occupies little space and can be swept around easily—it's a one legged machine.

Do You Get "THE SILENT PARTNER?"

It's the brainiest little magazine we know about. Sample copy free for the asking. Write for IT, and the Tumbler Book.

THE GLOBE MACHINE & STAMPING CO.

976 Hamilton St., Cleveland, O.

J. W. Jackman & Co.—Caxton House, Westminster, London—English Agents

LEIMAN'S NEW SAND BLAST

PATENTED.

SIMPLE. EFFECTIVE. ECONOMICAL.

NEW FEATURES—Let us tell you about them.

RESULTS—Let us show you samples of work done.

IMPROVED HIGH PRESSURE BLOWER

NOISELESS. INEXPENSIVE.

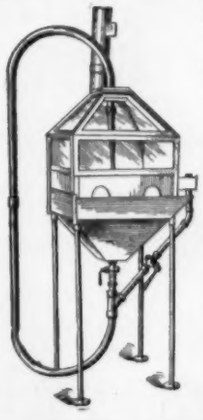
Delivers Greater Volume at Higher Pressure Than Any Other Made.

PATENTED.

LEIMAN BROS.

Jewelers', Silversmiths' and Metal Workers' Machinery, Tools and WORK BENCHES

139-141-143 Centre St., NEW YORK, N. Y.
66-68-70 Bonyk amper Ave., NEWARK, N. J.



SIPPEL PATENT SAND BLAST

PATENTED SEPT. 16, 1902.

For cleanliness, perfect work and rapidity of action it is without an equal. A trial will cost nothing.

References from leading Jewelers and Brass Finishers will be furnished upon request.

Correspondence solicited, and all information cheerfully furnished. For full particulars and price address

THEO. A. SIPPEL

Patentee and Sole Manufacturer

205 McWhorter Street, Newark, N. J.

SOMETHING NEW FOR THE BUFFING, POLISHING AND GRINDING ROOM

Patent Separator

V. & L. Patent Separator, Hood and Metal Saving Device

**HUNDREDS OF THEM IN USE
WHY NOT BE UP-TO-DATE?**

This Separator is constructed to separate the line and dust from the air. Also can be placed next to the fan and collects material in bottom.

VENDERBUSH & LOOMAN

177 LARNED ST., WEST, DETROIT, MICH., U.S.A.

Patent Hood and Metal Saving Device

Save Money

The hood and metal saving device for polishing or grinding wheels can be attached easily to machine and saves from 5 to 20 lbs. of metal per day.

Dumping Position.

Operation of BAIRD TILTING TUMBLERS is VISIBLE, not BLIND

Two size machines, No. 1 and No. 2, will take Barrels of all kinds up to 36 in. diameter.

New Catalogue "C" tells all.

THE BAIRD MACHINE CO., Oakville, Conn., U. S. A.

BAIRD TUMBLERS

are quick and easy to operate, built STRONG to withstand rough usage and will run in either position shown in cuts or at any intermediate elevation.

WRITE NOW

Elevated Position.

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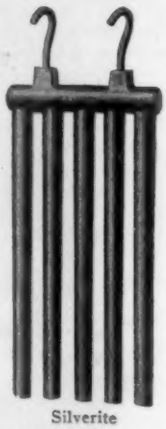
COMPLETE ELECTRO GALVANIZING OUTFITS WITHOUT ROYALTY ON SOLUTION

ELECTROPLATING AND POLISHING SUPPLIES, COMPLETE PLANTS INSTALLED

LOW VOLTAGE GENERATORS, DIRECT CONNECTED GENERATOR SETS 50 to 10,000 AMPERES CAPACITY

Patent Corrugated Anode.

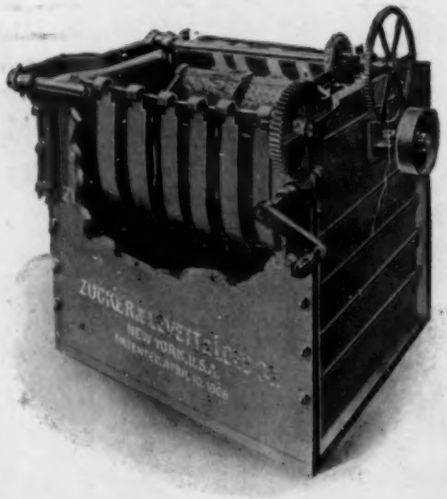
Patented Corrugated and Silverite Nickel Anodes (Patented), with patented malleable Nickel hook cast solid.



Silverite Anode. Patented.

PLATING AND POLISHING AT ONE OPERATION IN NICKEL, COPPER, ZINC, BRASS OR BRONZE

Our patented revolving plating apparatus consists of a wooden tank, containing a hexagonal wooden cylinder which is slowly revolved in the solution. All sorts of small work, such as nuts, bolts, screws, etc., can be economically and quickly Plated and Polished at one operation, labor of stringing also being done away with. The apparatus is fitted with a crank and gear by which the cylinder can be raised out of the solution to receive or discharge work. We make for this apparatus special curved anodes so that the anode surface is at all points equidistant from the work.



Patented in U. S. and Canada, April, 1906.

Patented in U. S. and Canada, April, 1906.

We should be pleased to receive small sample lots of work to be plated to demonstrate the practicability of the apparatus, or it can be seen in practical operation at our works. For further particulars and prices apply to the Patentees and Sole Manufacturers

ZUCKER & LEVETT & LOEB CO., New York City, U. S. A.

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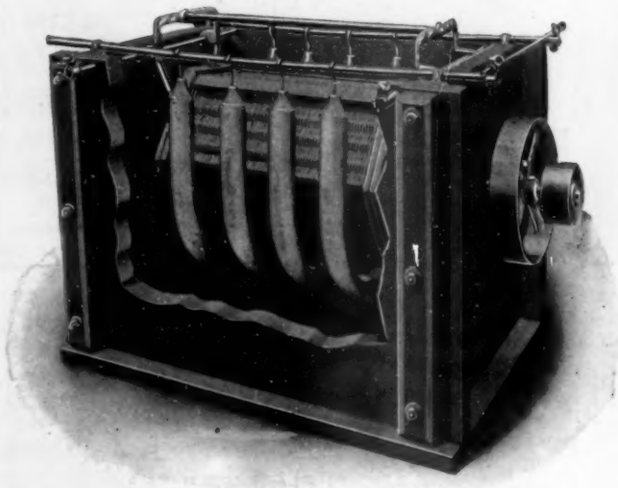

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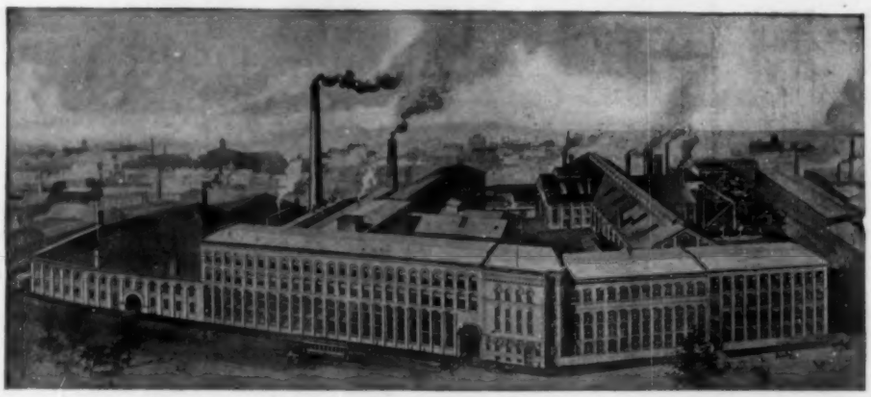

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